The PHOTOFACT Servicer

SET 403 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JUNE 1, 1958

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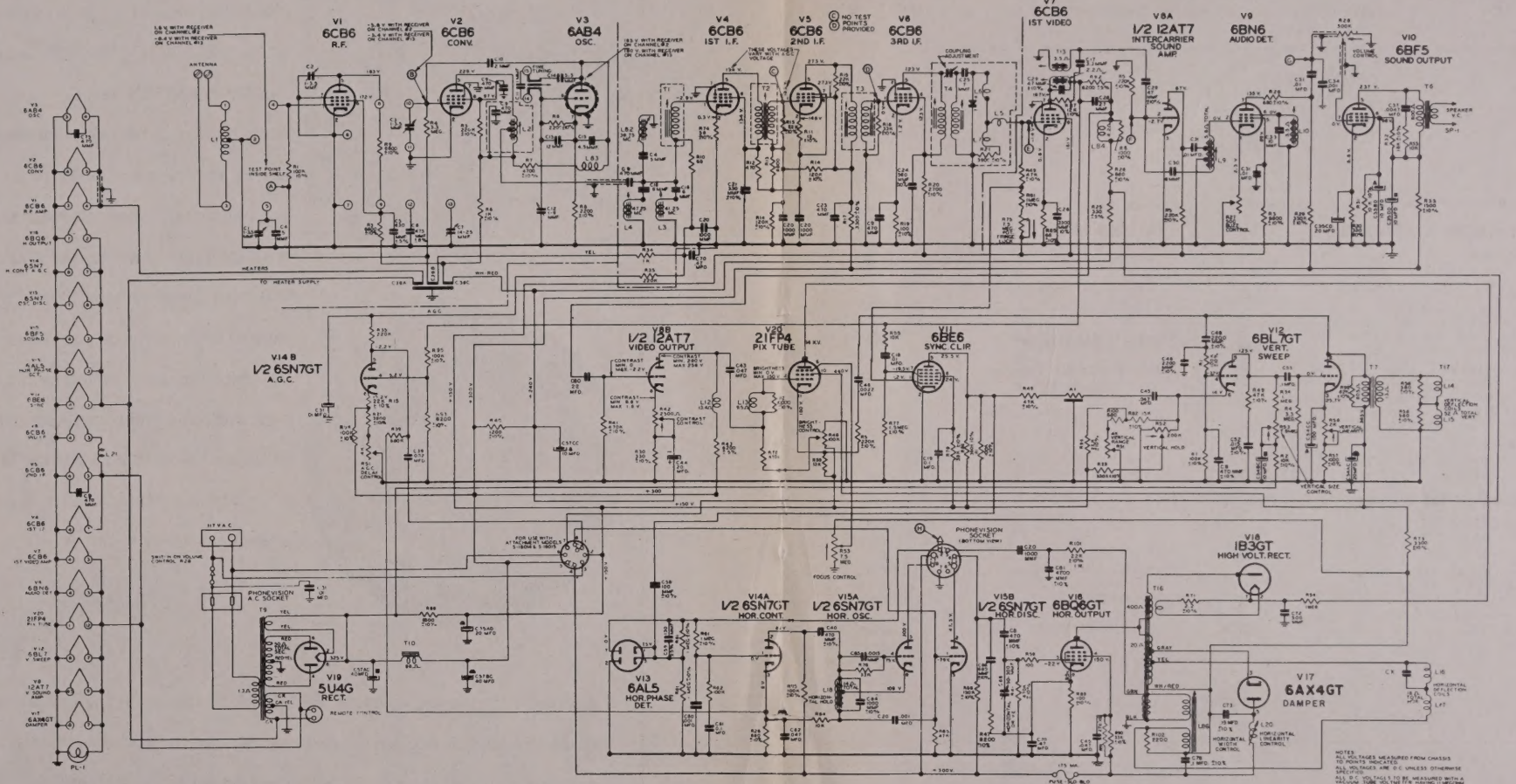
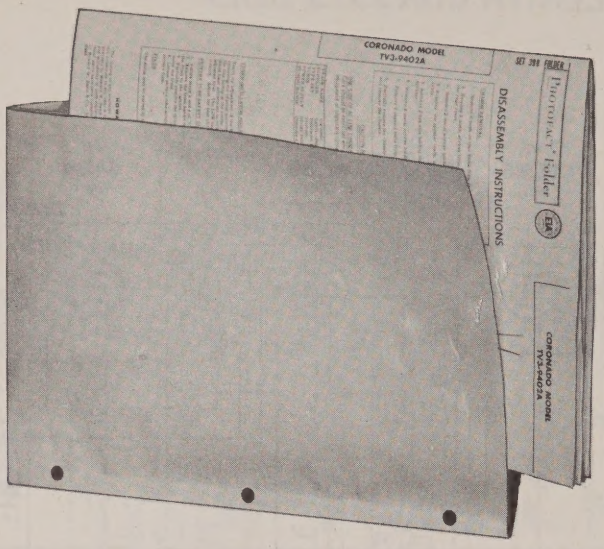
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

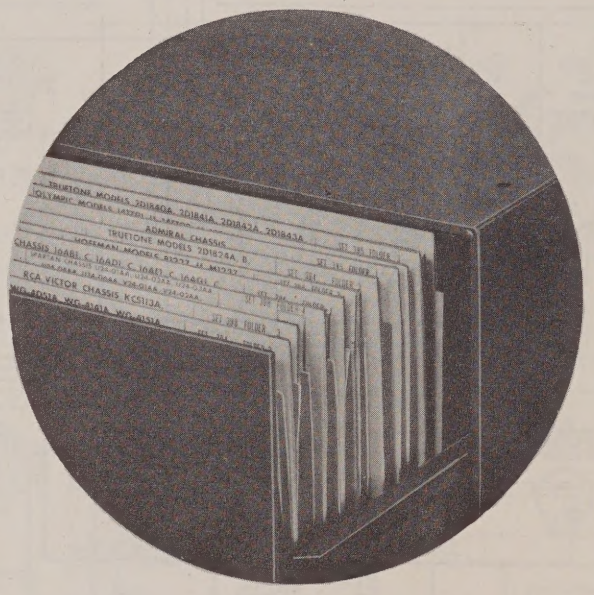
ZENITH CHASSIS 20J23


V1 6CB6 R.F.
V2 6CB6 CONV.
V3 6AB4 OSC.
V4 6CB6 1ST I.F.
V5 6CB6 2ND I.F.
V6 6CB6 3RD I.F.
V7 6CB6 1ST VIDEO
V8A 1/2 12AT7 INTERCARRIER SOUND AMP.
V9 6BN6 AUDIO DET.
V10 6BF5 SOUND OUTPUT
V14B 1/2 6SN7GT A.G.C.
V8B 1/2 12AT7 VIDEO OUTPUT
V20 21FP4 PIX TUBE
V11 6BE6 SYNC CLIP.
V12 6BL7GT VERT. SWEEP
V18 1B3GT HIGH VOLT. RECT.
V14A 1/2 6SN7GT HOR. CONT.
V15A 1/2 6SN7GT HOR. OSC.
V15B 1/2 6SN7GT HOR. DISC.
V16 6BQ6GT HOR. OUTPUT
V13 6AL5 HOR. PHASE DET.
V19 5U4G RECT.
V17 6AX4GT DAMPER
ANTENNA
TEST POINT INSIDE SHELF
HEATERS
TO HEATER SUPPLY
AGC
PHONEVISION A.C. SOCKET
PHONEVISION SOCKET (BOTTOM VIEW)
FOCUS CONTROL
VERTICAL HOLD
VERTICAL SIZE CONTROL
HORIZONTAL LINEARITY CONTROL
HORIZONTAL WIDTH CONTROL
HORIZONTAL DEFLECTION COILS
SPEAKER V.C.
VOLUME CONTROL
REMOTE CONTROL
PL-1
NOTES:
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL D.C. VOLTAGES TO BE MEASURED WITH A VOLTOHM TYPE VOLTMETER HAVING 11 MEGOHM INPUT RESISTANCE.
ALL VOLTAGE MEASUREMENTS TO BE MADE WITH CHANNEL SELECTOR SET TO CHANNEL 2 (54-60 MC) SELECTOR SET TO 2 UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
RESISTANCE MEASUREMENTS SHOWN WITH COILS DISCONNECTED FROM CIRCUIT.
ALL RESISTANCES NOT GIVEN ARE UNDER ONE OHM.
ALL CONDENSER CAPACITY TOLERANCE ±20% UNLESS OTHERWISE SPECIFIED.
ALL TUBES MAY TURN FIVE UNDER VOLTAGE TO 105 VOLTS WITH NO CHANGE IN PERFORMANCE.
CIRCLED ALPHABETS INDICATE ALIGNMENT AND TEST POINTS
DENOTES CHASSIS

SCHEMATIC DIAGRAM COURTESY ZENITH RADIO CORP

ANOTHER FILING IDEA FOR YOUR PHOTOFACT LIBRARY





Now - model-chassis data, set and folder numbers are also printed on the folded edge of all new folders in each PHOTOFACT set. (Examine the folders in this set.)

This additional listing of information offers you the opportunity to invert the individual folders and file them with the folded edge up for a more effective filing system. New TV jackets included with this set are designed for use with either the present method or new inverted method of filing. Give this new filing method a try and see for yourself how much more convenient it can be.

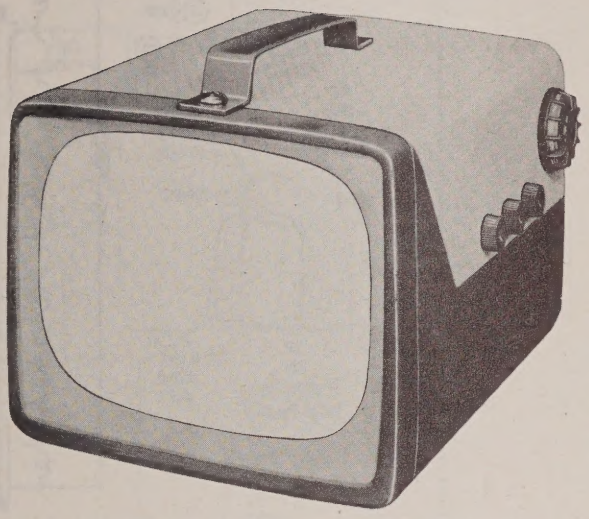
Remember - the key to every PHOTOFACT library - regardless of filing system - is an up-todate Sams Master INDEX and monthly supplement ! If you are not receiving them regularly, send us your name and address in care of the INDEX Mailing List. We will gladly mail all new copies to your store or shop each month free of charge.

ARTONE MODELS 10TS90T, 10TS90TA, 10TS91T

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs.
2. Remove 4 metal screws and swing rear cover up over the top.
3. Remove 2 antenna leads.
4. Remove the center bolt from the handle .
5. Remove 3 chassis bolts and the 2 rear feet from the bottom.
6. Remove the chassis.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Artone Models 10TS90T, 10TS90TA, 10TS91T
SUPPLIER	Affiliated Retailers, 855 Ave. of America, New York, N.Y.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 115 Watts, 1.14 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 11 o'clock, and should be adjusted first. The LOW band adjustment is located at 3 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 metal screws holding the handle. Remove 2 metal screws from the bottom front edge of the cabinet. Remove the front and safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSES

A 4.7Ω fusible resistor (R68) is used for LV power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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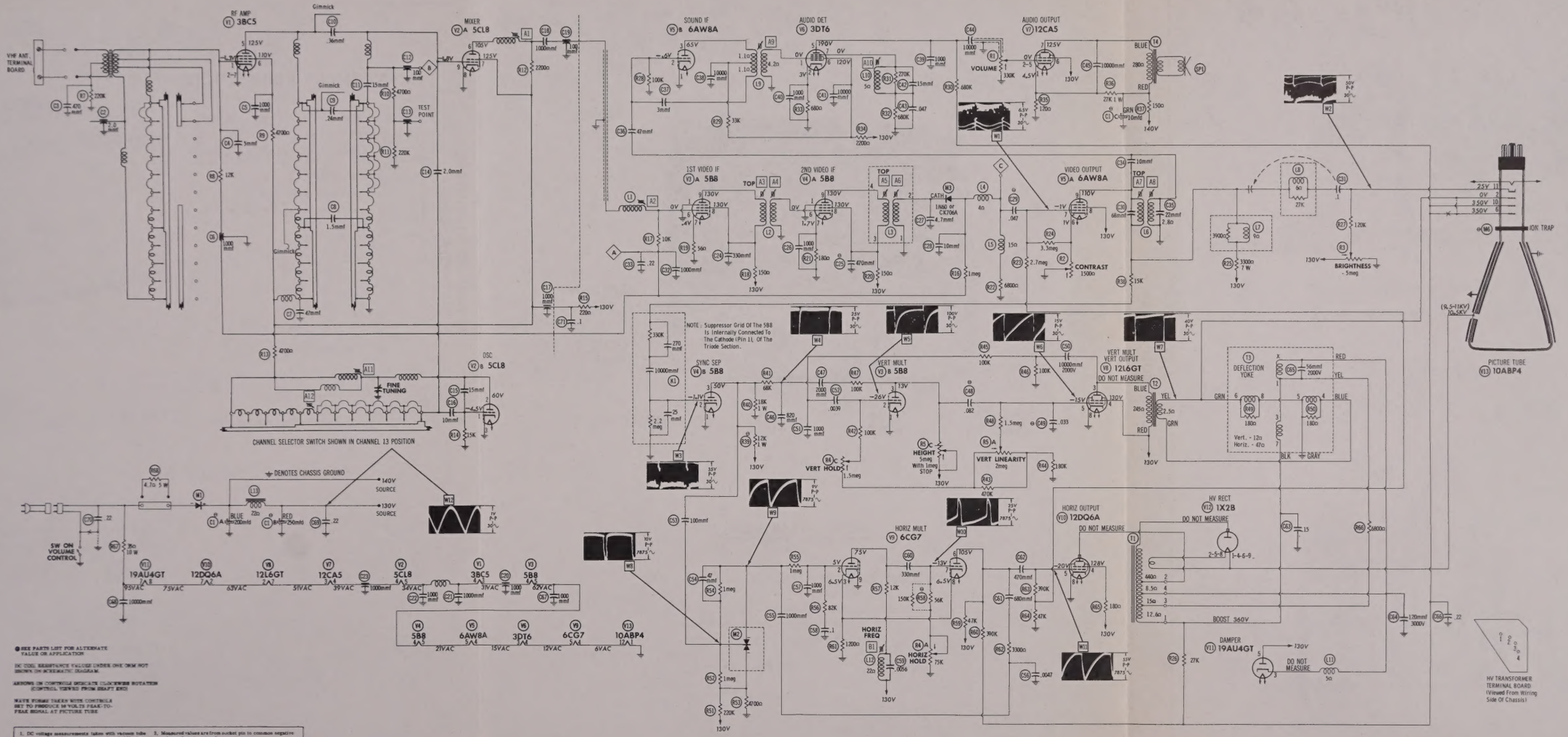
SET 403 FOLDER 1


RF AMP V1 3BC5
MIXER V2A 5CL8
OSC V2B 5CL8
SOUND IF V5B 6AW8A
AUDIO DET V6 3DT6
AUDIO OUTPUT V7 12CA5
1ST VIDEO IF V3A 5B8
2ND VIDEO IF V4A 5B8
VIDEO OUTPUT V5A 6AW8A
SYNC SEP V4B 5B8
VERT MULT V3B 5B8
VERT MULT VERT OUTPUT V6 12L6GT
HORIZ MULT V9 6CG7
HORIZ OUTPUT V10 12DQ6A
HV RECT V12 1X2B
DAMPER V11 19AU4GT
PICTURE TUBE V13 10ABP4
VHF ANT. TERMINAL BOARD
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
FINE TUNING
TEST POINT
VOLUME
CONTRAST 1500Ω
BRIGHTNESS - 5meg
VERT HOLD
HEIGHT 5meg With 1meg STOP
VERT LINEARITY 2meg
HORIZ FREQ
HORIZ HOLD 75K
DEFLECTION YOKE
ION TRAP
BOOST 360V
DO NOT MEASURE
DENOTES CHASSIS GROUND
140V SOURCE
130V SOURCE
SW ON VOLUME CONTROL
NOTE: Suppressor Grid Of The 5B8 Is Internally Connected To The Cathode (Pin 1), Of The Triode Section.
HV TRANSFORMER TERMINAL BOARD (Viewed From Wiring Side Of Chassis)
19AU4GT 12DQ6A 12L6GT 12CA5 5CL8 3BC5 5B8
6AW8A 3DT6 6CG7 10ABP4

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 10 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

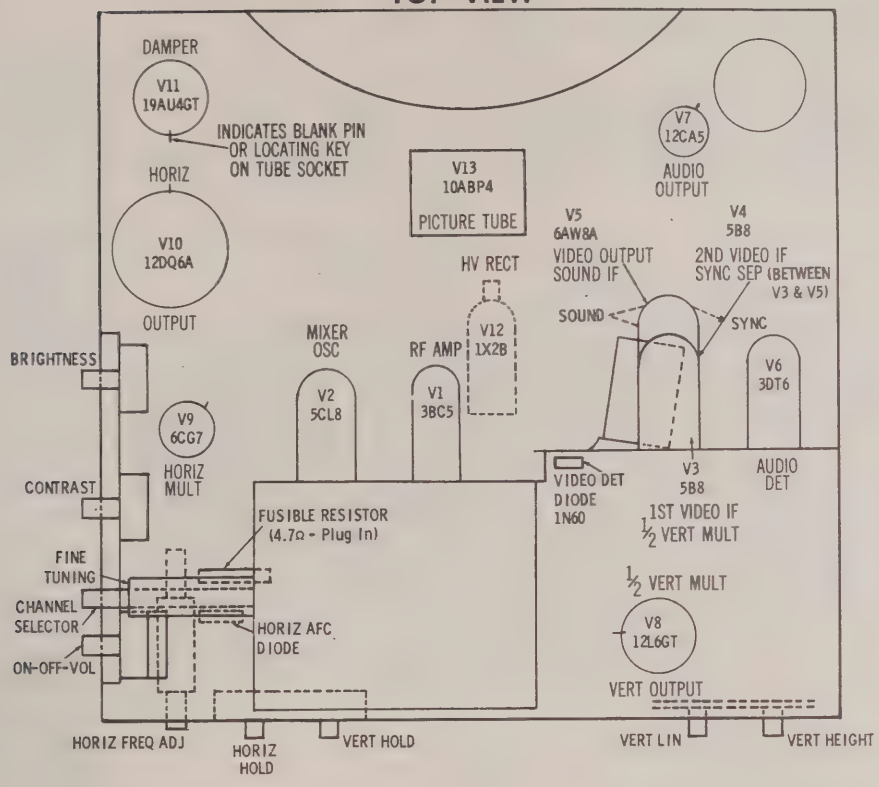
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ARTONE MODELS 10TS90T, 10TS90TA, 10TS91T

TUBE PLACEMENT CHART

TOP VIEW



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

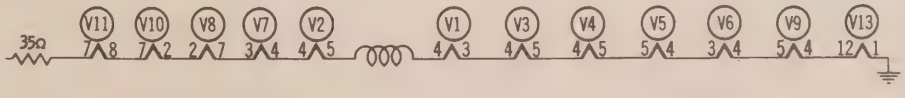
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R68), Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, Diode (M3), V5**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V13**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V3, V4, V8**
No horiz. sync - **V4, Diode (M2), V9**
No vert. or horiz. sync - **V4**

SWEEP FAILURE
No raster, has sound - **M2, V9, V10, V11, V12, V13**
No vertical deflection - **V3, V8**
Poor vert. linearity or foldover - **V3, V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1**
Vert. off freq. - **V3, V4, V8**
Horiz. off freq. - **V4, M2, V9**

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to point Ⓐ. Positive to chassis.
Disable oscillator by replacing Mixer-Osc. tube 5CL8 (V2) with a 5CL8 with pin 1 removed.
Short the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF ceramic capacitor	High side to point Ⓑ. Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any channel.	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V3). Low side to chassis.	A1, A2	Adjust for response similar to Fig. 2 with markers in proper positions.
2.	"	High side to pin 6 (grid) of 5B8 (V3). Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V4). Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point B. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed to correct for curve similar to Fig. 3. Remove bias and replace 5CL8 (V2).

SOUND IF ALIGNMENT

Set the contrast control fully clockwise. Set volume control at midrange.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF ceramic capacitor	High side to point Ⓒ. Low side to chassis.	Not used.	4.5MC (400∿ 30% AM Mod)	Any non-interfering channel.	Vert. amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7, A8	Turn A7 fully counter clockwise. Turn A8 fully clockwise. Turn A7 clockwise for MINIMUM 400∿ indication on scope.
6.	"	"	4.5MC (15KC Swp)	Not used.	"	Across secondary of output transformer.	A8, A9, A10	Use only enough sweep generator output to provide usable pattern on scope. Turn A10 fully counter clockwise. Adjust A8, A9 and A10 for maximum indication on scope. Remove test equipment and tune in a TV station. Retouch A10 for MINIMUM buzz.

OSCILLATOR ALIGNMENT

Turn the set on and tune in the highest band channel (7-13) operating in the area and adjust A11 for clearest picture and best sound. A11 is located to the left and SLIGHTLY above the tuning shaft. Switch the channel selector to the highest low band channel (2-6) operating in the area and adjust A12 for clearest sound and best picture. A12 is located directly to the right of the tuner shaft.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

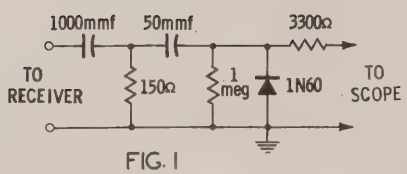


FIG. 1

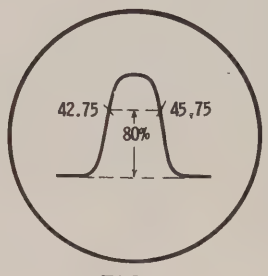


FIG. 2

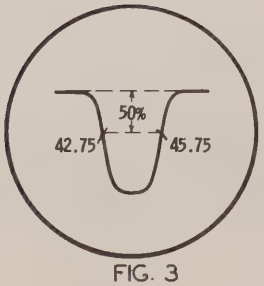


FIG. 3

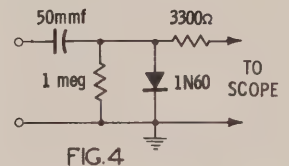
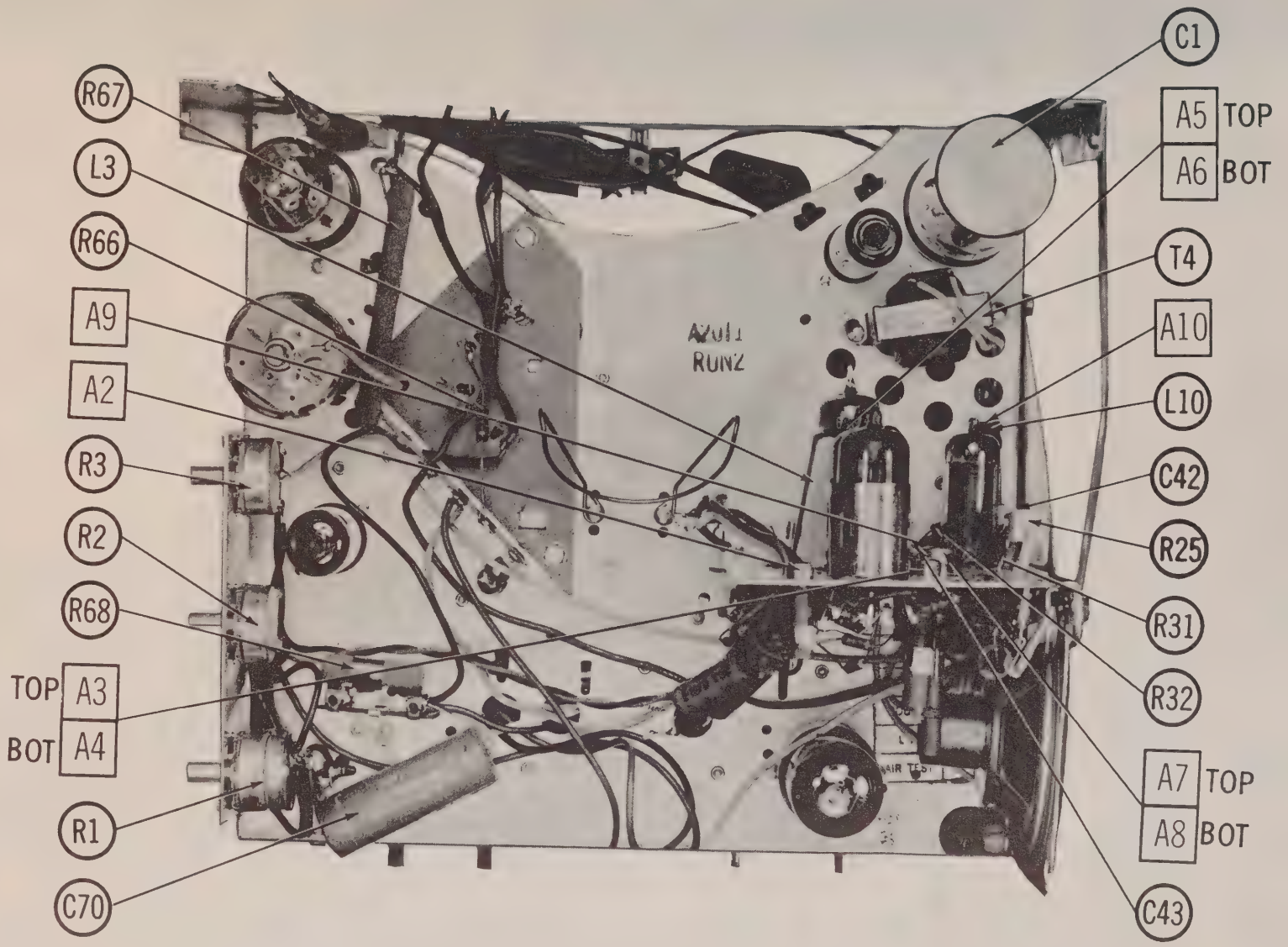


FIG. 4



CHASSIS TOP VIEW

ARTONE MODELS 10TS90T, 10TS90TA, 10TS911

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer-Osc.	6CL8	
V3	1st Video IF - Vert. Mult.	5B8	
V4	2nd Video IF - Sync Sep.	5B8	
V5	Video Output-Sound IF	6AW8A	
V6	Audio Det.	3D7G	
V7	Audio Output	12CA5	
V8	Vert. Mult. - Vert. Output	12LR6T	
V9	Horiz. Mult.	6CG7	
V10	Horiz. Output	12DQ6A	
V11	Damper	19AU4GT	
V12	HV Rectifier	13JB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	ARTONE PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V13	10ABP4		10ABP4B	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	ARTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	45A392	PR3-012		WT320	CDBT-1015	D-095	R2294 *
B	250	150						MT-1510	
C	10	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ARTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
C2	2.0									
C3	470		47A836	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C4	5			NPO-S1 5	DD-050	TCZ-4RT	C10V5C	TCO-5	ZT-5547	5TCCB-V5
C5	1000		47-503	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C6	1000			EF-001	MFT-1000				503C-D1	
C7	47		47CA20A470M	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C8	1.5			NPO-S1 1.5	TCZ-1R5	C10V15C	TCO-1.5	ZT-5515	5TCCB-V15	
C9	.34									
C10	.36									
C11	15			BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C12										
C13	100									
C14	2.0			NPO-S1 2. 2	TCZ-2. 2	C10V2C	TCO-2			
C15	15									M1000
C16	10			NPO-S1 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	
C17	1000			EF-001	MFT-1000				503C-D1	
C18	1000		47-503	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C19	100									
C20	1000			EF-001	MFT-1000				503C-D1	
C21	1000		47-503	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C22	1000		47-503	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C23	1000			EF-001	MFT-1000				503C-D1	
C24	330		47A541	BPD-00033	DD-331	C10T33	ED-330	UC-5333	5GA-T33	
C25	470		47A543	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C26	1000		47A230	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C27	4.7		47B402-S	NPO-S1 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-555	5TCCB-V47	
C28	10		47CA20A100K	S1 10	D6-100	L10Q1	GP-10	UC-541	5GA-Q1	
C29	.047	130	46D618-473M2	P388N-047	DF-503	CUB3S47		GEM-4147	2TM-S47	
C30	68		47-635							N75
C31	.1	200	46D618-104M3	P388N-1	DF-104	CUB5P1		GEM-301	2TM-P1	
C32	1000		47A230	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C33	.22	100	46D618-224M3	P388N-22		CUB2P22		GEM-3022	2TM-P22	
C34	10		47A160-11	S1 10	D6-100	L10Q1	GP-10	UC-541	5GA-Q1	
C35	22		47-634							N75
C36	47		47CA20A470M	S1 47	D6-470	L10Q47	GP-47	UC-5447	5GA-Q47	
C37	3		47A507	SI 3	D6-030	L10V3	TCO-3	ZT-553		
C38	10000		47A334	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C39	1000		47A230	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C40	1000		47A230	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C41	10000		47A334	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C42	15		47B480							
C43	.047	300	46D618-473M2	BPD-05	DF-503	CUB3S47		GEM-3147	2TM-S47	
C44	10000		47A334	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C45	10000		47A334	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C46	820		47-606	BPD-0008	D6-821	L10T82	ED-820		5GA-T82	
C47	2000		47A395	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C48	.082	300								
C49	.033	300		P388M-033	DF-303	CUB2S33		GEM-4133	6TM-S33	
C50	10000	3000	47-708					GEM-3011	BL-S10	
C51	1000		47-503	BPD-001	DD-102	BYA8D1	ED-001	DC521	5HK-D1	
C52	.0039	300	46BR392E4	BPD-004	D6-402	CUB2D39	GP-4000	GEM-634	6TM-D4	
C53	100		47CA20A101M	S1 100	D6-101	L10T1	GP-100	UC-531	5GA-T1	
C54	47		47CA20A470M	S1 47	D6-470	L10Q47	GP-47	UC-5447	5GA-Q47	
C55	1000		47A586	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C56	.0047	300	46D618-473K3	BPD-0047	D6-472	CUB2D47	GP-4700	GEM-6347	6TM-D47	
C57	1000		47A586	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C58	.1	300	46D618-104M3	P388N-1	DF-104	CUB3P1		GEM-301	2TM-P1	
C59	.0056	400	46BR562E4	P488N-005	D6-563	CUB4D5	GP-5600	GEM-435	6TM-D5	
C60	330		47X3D33L1K	1464-00033		1WT33			MS-347	
C61	680		47X3D68L1K	1464-00068		1WT68			MS-347	
C62	470		47A638	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C63	.15	900	46D618-154M6	P688N-15		CUB4P15		GEM-6015	6TM-P15	
C64	120	1000	47-640		DD30-121	BVB30T12			30GA-T12	
C65	56	2000	47A637		DD30-56	HVA20Q56	HD3-56	DC30456	20GA-Q56	
C66	.22	600		P688N-22		CUB4P22		GEM-6022	6TM-P22	
C67	1000		47A230	BPD-001	DD-102	BYA8D1	ED-1000	DC521	5HK-D1	
C68	10000		47A334	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C69	.22	300	46D618-224M6	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C70	.22	600	46D616-224M6	P488N-22		CUB4P22		GEM-6022	6TM-P22	
C71	.1	200	46D618-104M2	P288N-1	DF-104	CUB3P1		GEM-201	2TM-P1	

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: ARTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	25B1400	E-80	A47-500K-Z	Q3-132	TA334A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	U8-26	
R2A	1500Ω	½	25B1399	AB-515		Q7-109	U5	Contrast
B	Shaft			AK-3		Not Req.	Not Req.	
R3A	5Meg	½	25B1401	AB-88		Q7-141	TA56R	Brightness
B	Shaft			AK-2		Not Req.	Not Req.	
R4A	75K	½	25B1403	AB-38	A47-75K-S	Q11-138	PTA15L	Horiz. Hold
B	Shaft			AK-19	RN-3	TQ	Not Req.	
C	1.5Meg	½		AB-743	A47-1.5Meg-S	Q11-139	PTA39L	Vert. Hold
D	Shaft			AK-19	RN-3	TQ	Not Req.	
R5A	2Meg	½	25B1404	AB-75	A47-2Meg-S			Vert. Lin.
B	Shaft			AK-19	RN-3			
C	5Meg	½		AB-86	A47-4Meg-S			Height With 1Meg stop
D	Shaft			AK-19 *	RN-3 *			

* Use a 1Meg resistor in series with the right hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ARTONE PART No.	NOTES
R7	220K		23X20X224K	
R8	12K		23X20X123K	
R9	4700Ω		23X20X472K	
R10	4700Ω		23X20X472K	
R11	220K		23X20X224K	
R12	2200Ω		23X20X222K	
R13	4700Ω		23X20X472K	
R14	15K		23X20X153K	
R15	220Ω		23X20X221K	
R16	1Meg		23X20X105K	
R17	10K		23X20X103K	
R18	150Ω		23X20X151K	
R19	56Ω		23X20X560K	
R20	150Ω		23X20X151K	
R21	180Ω		23X20X181K	
R22	6800Ω		23X20X682K	
R23	2. 7Meg		23X20X275K	
R24	3. 3Meg		23X20X335K	
R25	3300Ω	7	24A1123	
R26	27K		23X20X273K	
R27	130K		23X20X134K	
R28	100K		23X20X104K	
R29	33K		23X20X333K	
R30	680K		23X20X684K	
R31	270K		23X20X274K	
R32	680K		23X20X684K	
R33	680Ω		23X20X681K	
R34	2200Ω		23X20X222K	
R35	120Ω		23X20X121K	
R36	27K	1	23X30X273K	
R37	150Ω		23X20X151K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ARTONE PART No.	NOTES
R38	15K		23X20X153K	
R39	12K	1	23X30X123K	
R40	18K	1	23X30X183K	
R41	68K		23X30X683K	
R42	100K		23X20X104K	
R43	470K		23X20X474K	
R44	180K		23X20X184K	
R45	100K		23X20X104K	
R46	100K		23X20X104K	
R47	100K		23X20X104K	
R48	1. 5Meg		23X20X155K	
R49	180Ω		23X20X181K	
R50	180Ω		23X20X181K	
R51	220K		23X20X224K	
R52	1Meg		23X20X105K	
R53	4700Ω		23X20X472K	
R54	1Meg		23X20X105K	
R55	1Meg		23X20X105K	
R56	82K		23X20X823K	
R57	12K		23X20X123K	
R58	56K		23X20X563K	
R59	47K		23X20X473K	
R60	390K		23X20X394K	
R61	1200Ω 5%		23X20X122J	
R62	3300Ω		23X20X332K	
R63	390K		23X20X394K	
R64	47K		23X20X473K	
R65	180Ω		23X20X181K	
R66	6800Ω		23X20X682K	
R67	35Ω	10	24-1086	
R68	4. 7Ω	5	24B1116	

Note 1. Some versions may use a 75K, 68K, 82K or an 82K paralleled by a 150K in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ARTONE PART No.	Halldorson PART No.	Merit PART No.		Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Horiz. Output Trans.	55-307							
T2	Vert. Output Trans.	55-308	Z1900 ①						
T3A	Yoke - Horiz. (24. 5MH) (90°) Vert. (11. 5MH)	53-398							
M5	Rear Cover & Centering Device	21-286							

① Connect #1 to plate, #2 to screen, #7 to yoke terminal #4, #10 to yoke terminal #6.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: ARTONE PART No.	QUAM PART No.	NOTES
SP1	3½"	PM	3-4Ω	85C196	3A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ARTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	51-2187				
L2	2nd Video IF	51-2188				
L3	3rd Video IF	50-688				
L4	RF Choke	53A307	19-1006		4634	16 Microhenries
L5	Shunt Peaking Coil	51-2103	19-3980		6146	7.5 Microhenries
L6A	4. 5MC Trap	51B1996				
B	1st Sound IF					
L7	Shunt Peaking Coil	51-2101	19-4400▲		6134▲	395 Microhenries; Wound on 3900Ω resistor.
L8	Series Peaking Coil	51-2184	19-3160 *		6120 *	160 Microhenries, wound on 27K resistor
L9	2nd Sound IF	51-2166				
L10	Quadrature Coil	51B1857			1480	
L11	RF Choke	53-342				7.5 Microhenries; IRC part #C1A

▲ Parallel with 3900Ω resistor.
* Parallel with 27K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA: ARTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	Ram PART No.	Thordarson PART No.	NOTES
L13			51-2109	19-1575		6210 ①		HS-4	

① Enlarge mounting hole. A 3900MMF capacitor may have to be used in place of .0056 (C59).

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT	REPLACEMENT DATA: ARTONE PART No.	Halldorson PART No.	Merit PART No	Stancor PART No.	Thordarson PART No.	Triad PART No
L12	.270A	21Ω	.5 HY 1000 ~(c)	56A351				20C64 ①	C-27X

① Drill new mounting holes.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ARTONE PART No.	REPLACEMENT DATA	
K1	Sync. Coupiate	270MMF, 25MMF, 10000MMF, 330K, 2. 2Meg	49A046	Aerovox Centralab Sprague	PA-533 PC-383 ST-2

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ARTONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No	INTERNATIONAL PART No		SARKES TARZIAN PART No.	NOTES
M1	.280A	27C238 ①	1023A ①	1N1007 ②	RS350SL ①		350A ①	
M2		27C236 ①	1215 ①③		1T1 ① ③			

① Selenium type. ② Germanium type. ③ 3 Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ARTONE PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M3	1N60	19C1864 *	1N60	1N60	Video Detector (Pigtail)

* Alternate part #19C1980.

MISCELLANEOUS

ITEM No.	PART NAME	ARTONE PART No.	NOTES
M4	Tuner	1-3067	VHF, Ch. A3011
	Tuner	1D3051	UHF-VHF, Ch. B3011
M5	Centering Device	21-286	Includes yoke rear cover
M6	Ion Trap	21-151	

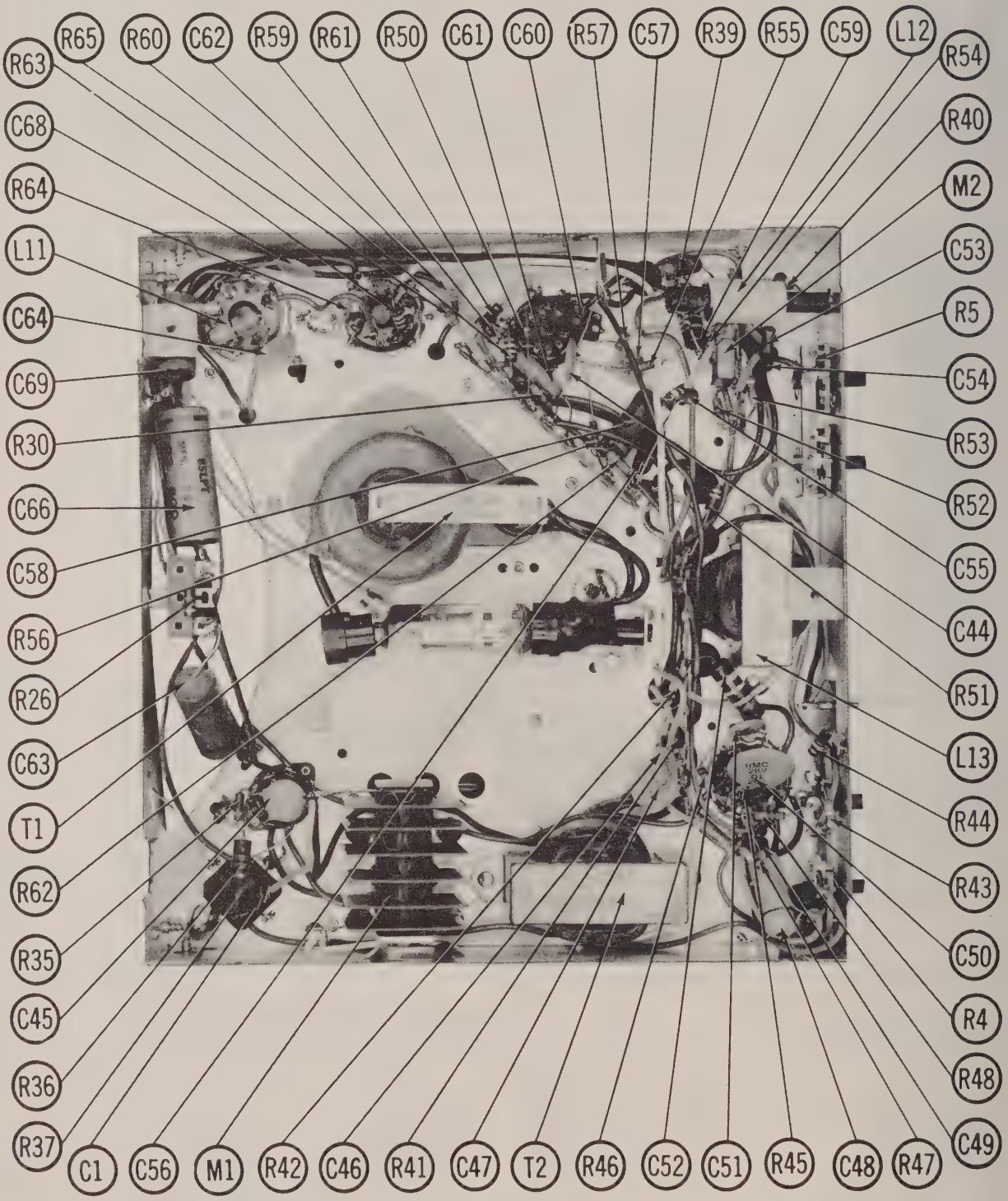
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

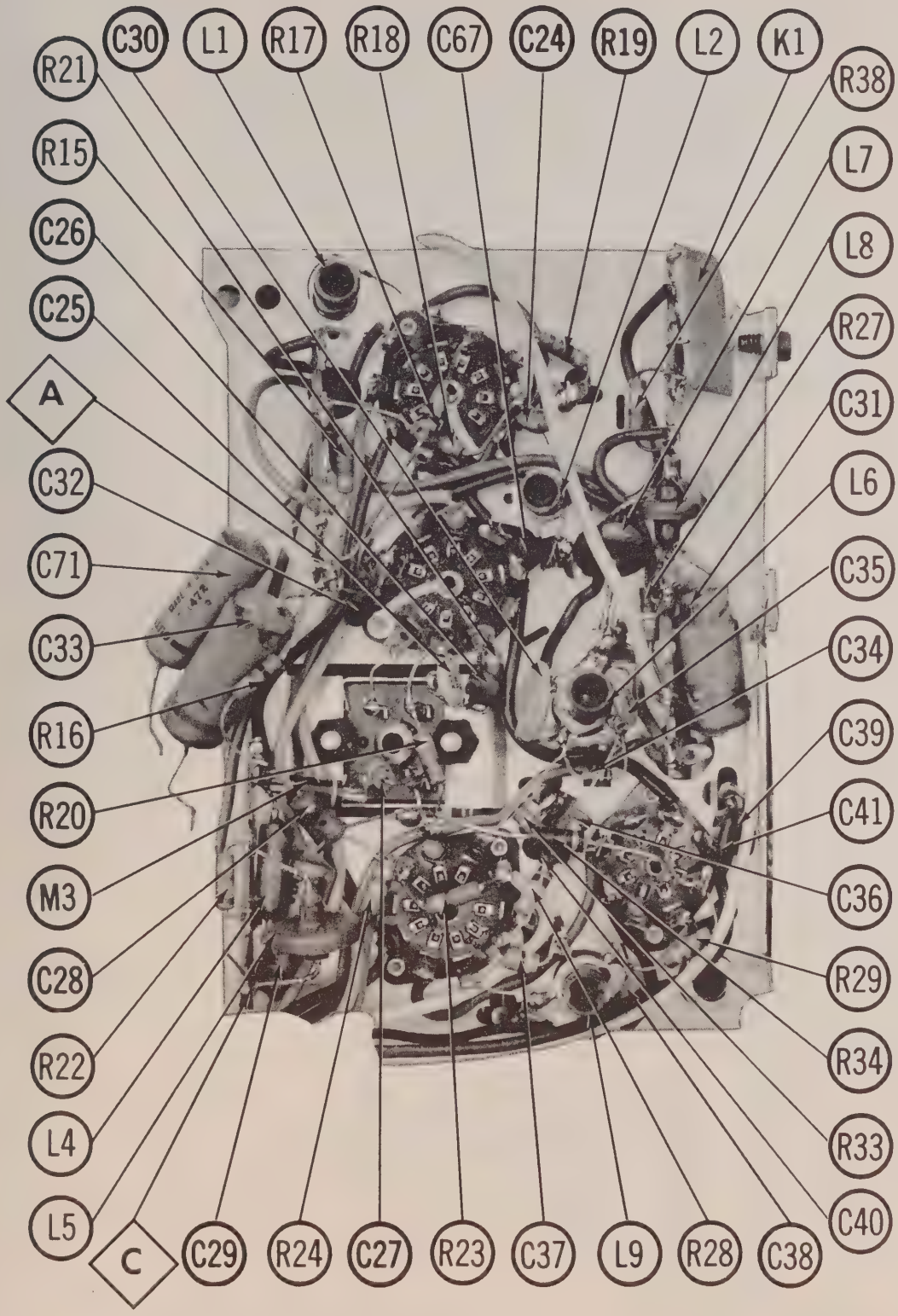
NAME	PART NO.	DESCRIPTION
Safety Glass	22D535	
Handle	8A3883	
Handle	41A60012	Complete Assy.
Knob	15A1060	Channel Selector
Knob	15C1058	Fine Tuning
Knob	15E1057	Control, 3 used
Cabinet	41-60168	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ARTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T4	4300Ω	3-4Ω	55C306	21107 ①	A-3026	A-3877 ①	24S51 ①	S-6X	① Drill one new mtg. hole.



CHASSIS-BOTTOM VIEW



VERTICAL CHASSIS BOTTOM VIEW

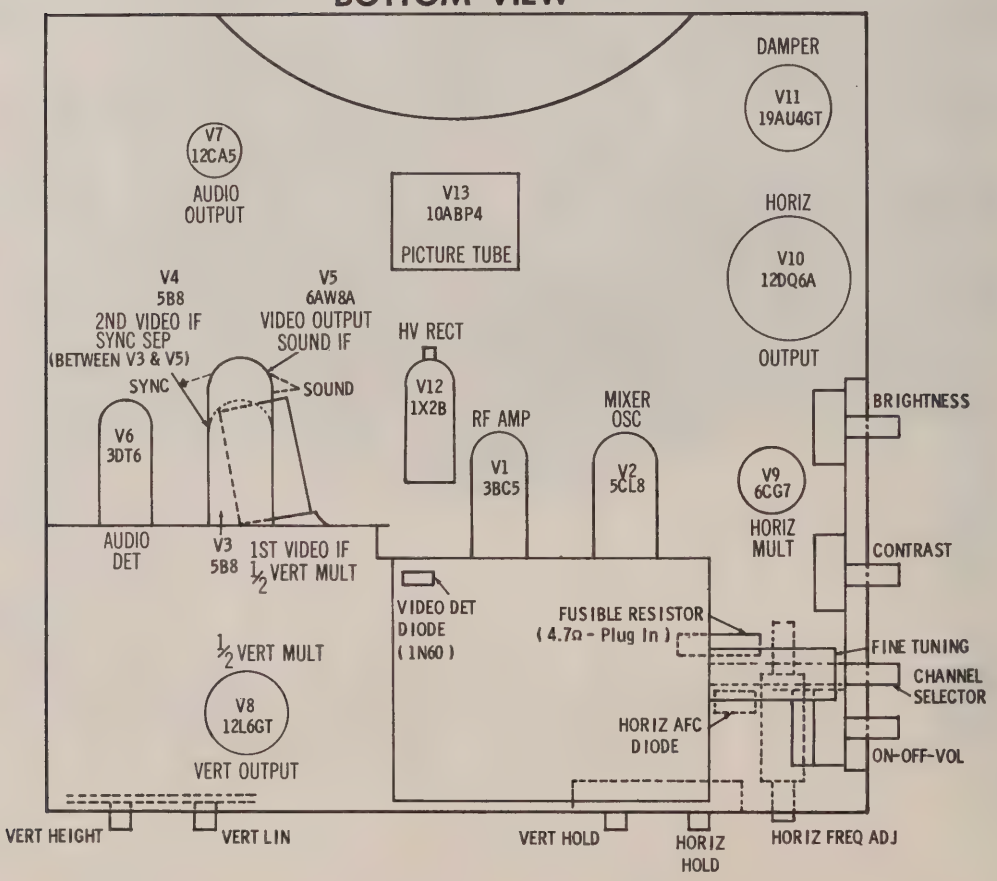
SET 403 FOLDER 1

RESISTANCE MEASUREMENTS

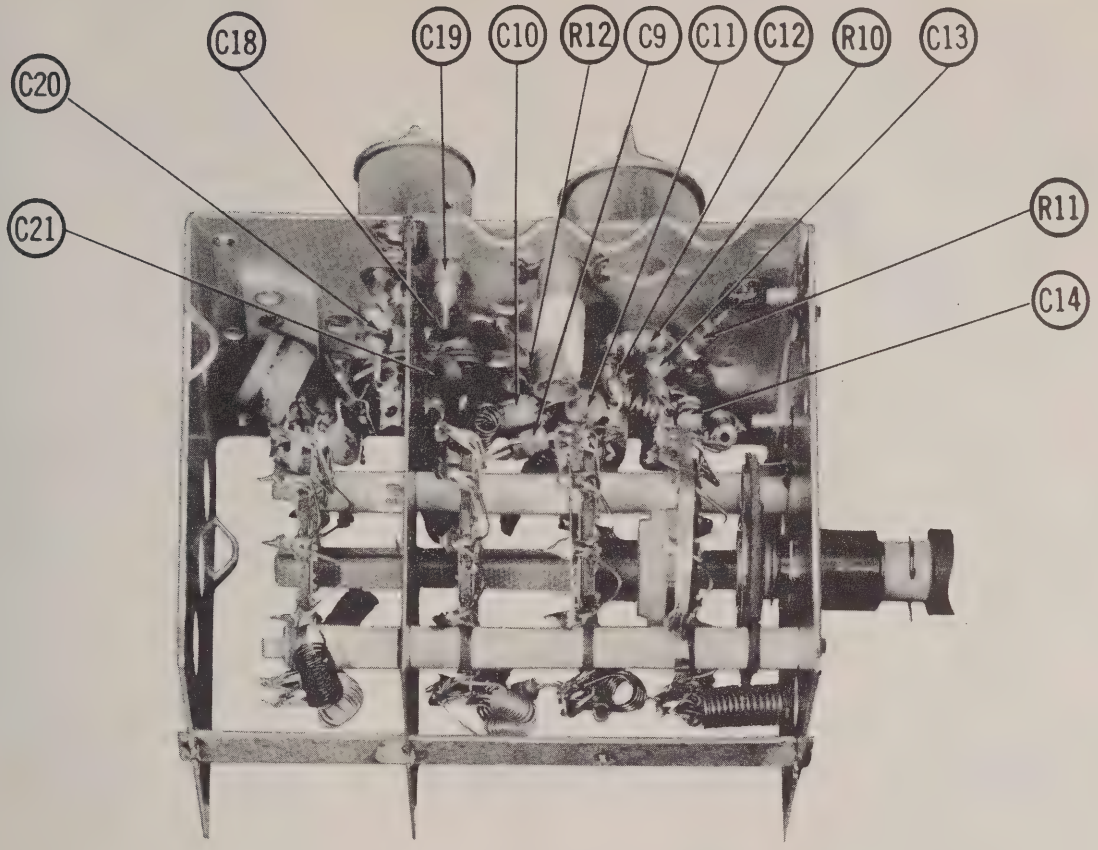
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	6.5Ω	7Ω	†240Ω	†5000Ω	0Ω		
V2	5CL8	15K	†5000Ω	0Ω	7.5Ω	7Ω	†2400Ω	†240Ω	0Ω	220K
V3	5B8	0Ω	• 1.3Meg	•†2.7Meg	6.5Ω	6.5Ω	1Meg	56Ω	†170Ω	†170Ω
V4	5B8	0Ω	2.2Meg	†12K	5.5Ω	5Ω	0Ω	180Ω	†170Ω	†170Ω
V5	6AW8A	0Ω	100K	†35K	3.5Ω	5Ω	• 10Ω	1.4Meg	†22Ω	†3300Ω
V6	3DT6	4.2Ω	680Ω	†3.5Ω	3Ω	‡700K	†2200Ω	680K		
V7	12CA5	120Ω	270K	9Ω	7.5Ω	270K	†22Ω	†430Ω		
V8	12L6GTB	TP	10.5Ω	†260Ω	†22Ω	•2.3Meg	TP	9Ω	0Ω	
V9	6CG7	†47K	• 75K	1200Ω	1.5Ω	3Ω	†12K	1.8Meg	1200Ω	
V10	12DQ6A	TP	10.5Ω	TP	†200Ω	440K	TP	11.5Ω	0Ω	TOP CAP ‡13Ω
V11	19AU4GT	NC	TP	480K	NC	†22Ω	TP	13Ω	11.5Ω	
V12	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡453Ω
V13	10ABP4	0Ω	3Ω	PIN 6 ‡27K	PIN 10 ‡27K	PIN 11 •†120K	PIN 12 1.5Ω			

† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V11.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT

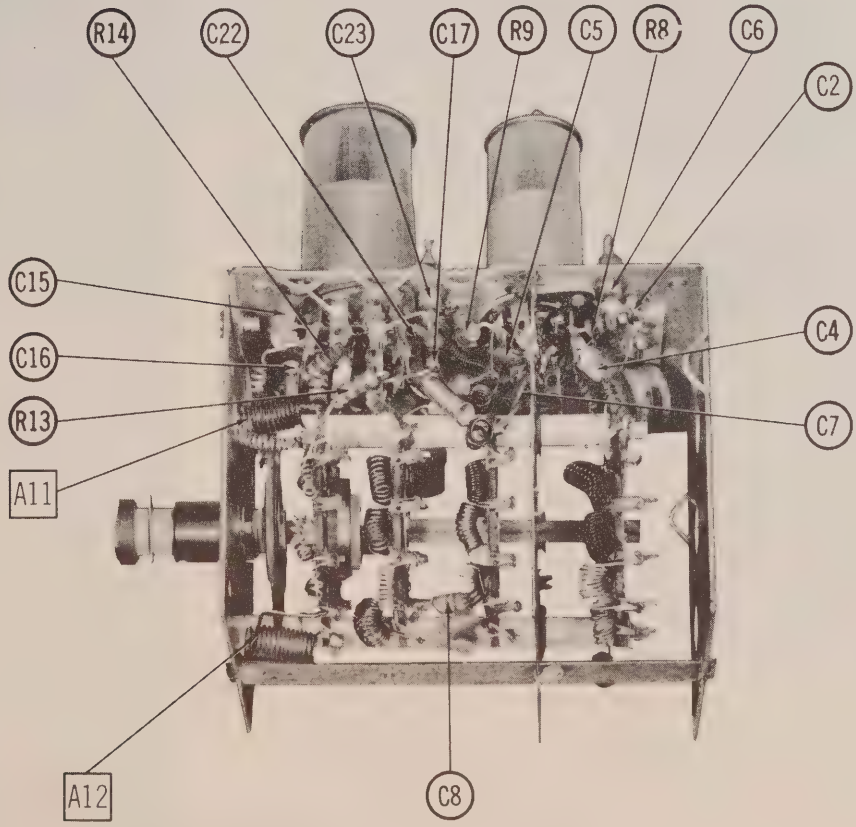
BOTTOM VIEW



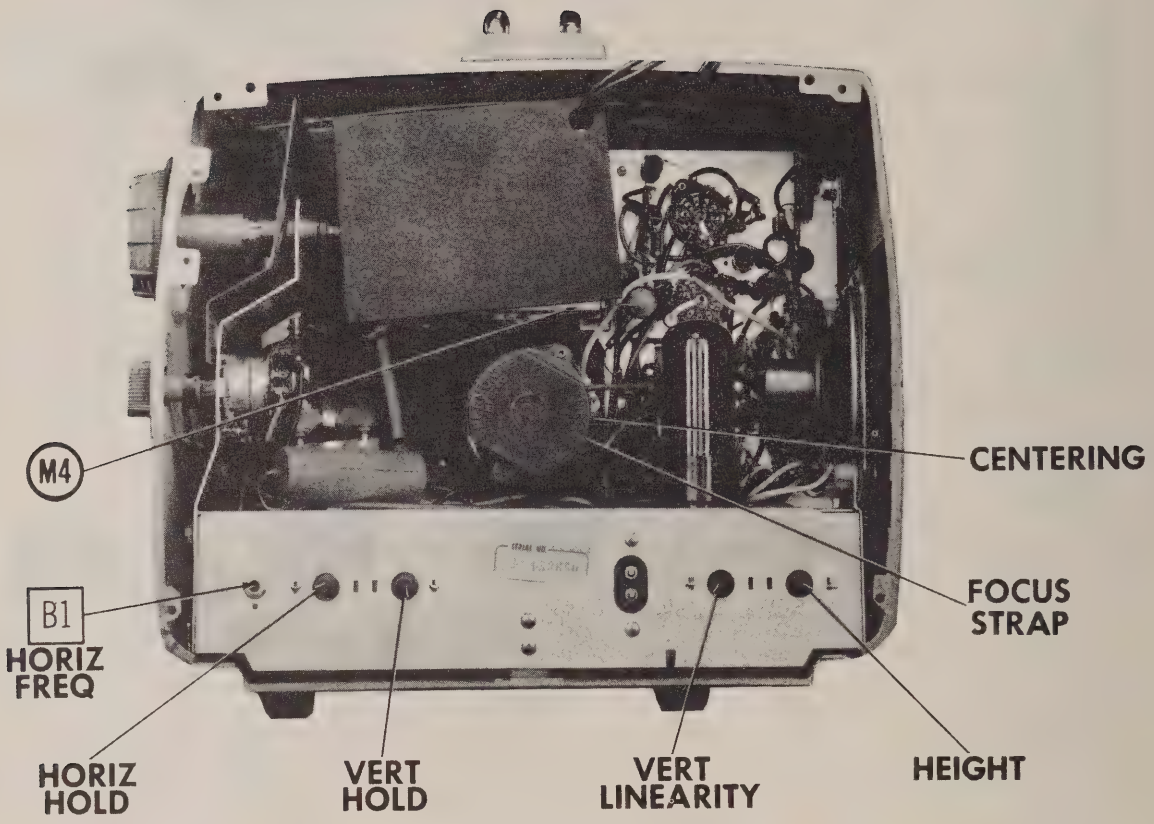
TUBE PLACEMENT CHART



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.
3. Check other stations and if necessary, retouch B1 for best sync action on all channels.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 3 push-on type knobs from the front. Remove 3 screws holding the knob escutcheon. Remove the escutcheon and remaining knobs from the front.

2. Remove 10 wood screws holding the rear cover. Remove the rear cover.

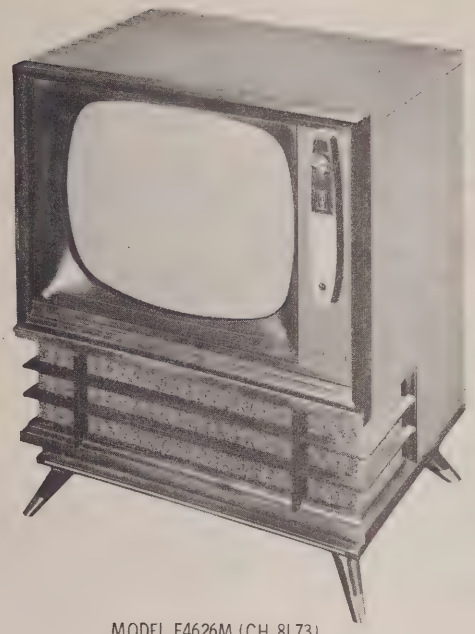
3. Remove the picture tube socket, HV lead, yoke plug and speaker leads.

4. Remove 2 wood screws holding the TV-Phono switch bracket.

5. Remove 2 wood screws from the top chassis brace.

6. Remove 3 chassis bolts from the bottom.

7. Remove the chassis.



MODEL F4626M (CH. 8L73)

PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L, F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

TRADE NAME	Philco	MODELS	CHASSIS
		F4216, F4216L, F4623	8L71
		UF4216, UF4216L, UF4623	8L71U
		F6624T, F6624TL	8L72
		UF6624T, UF6624TL	8L72U
		F4626, F4626L, F4626M, F4627, F4627L	8L73
		UF4626, UF4626L, UF4626M, UF4627, UF4627L	8L73U
		Remote Control	RC30

MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 205 Watts, 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF Oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws from the trim strip at the top of the safety glass. Tilt glass out at the top and lift up to remove.

FOCUS

The focus may be varied by means of a screw in the Focus Magnet. Using a non-ferrous screwdriver adjust the screw in or out for best focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Remove 3 push-on type knobs from the front. Remove 3 screws holding the knob escutcheon. Set the Horizontal Hold control at the center of its range and adjust the inner shaft (Horiz. Aux. control) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the Discriminator secondary (A8) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by means of a centering arm. Adjust the arm from side to side, and up and down until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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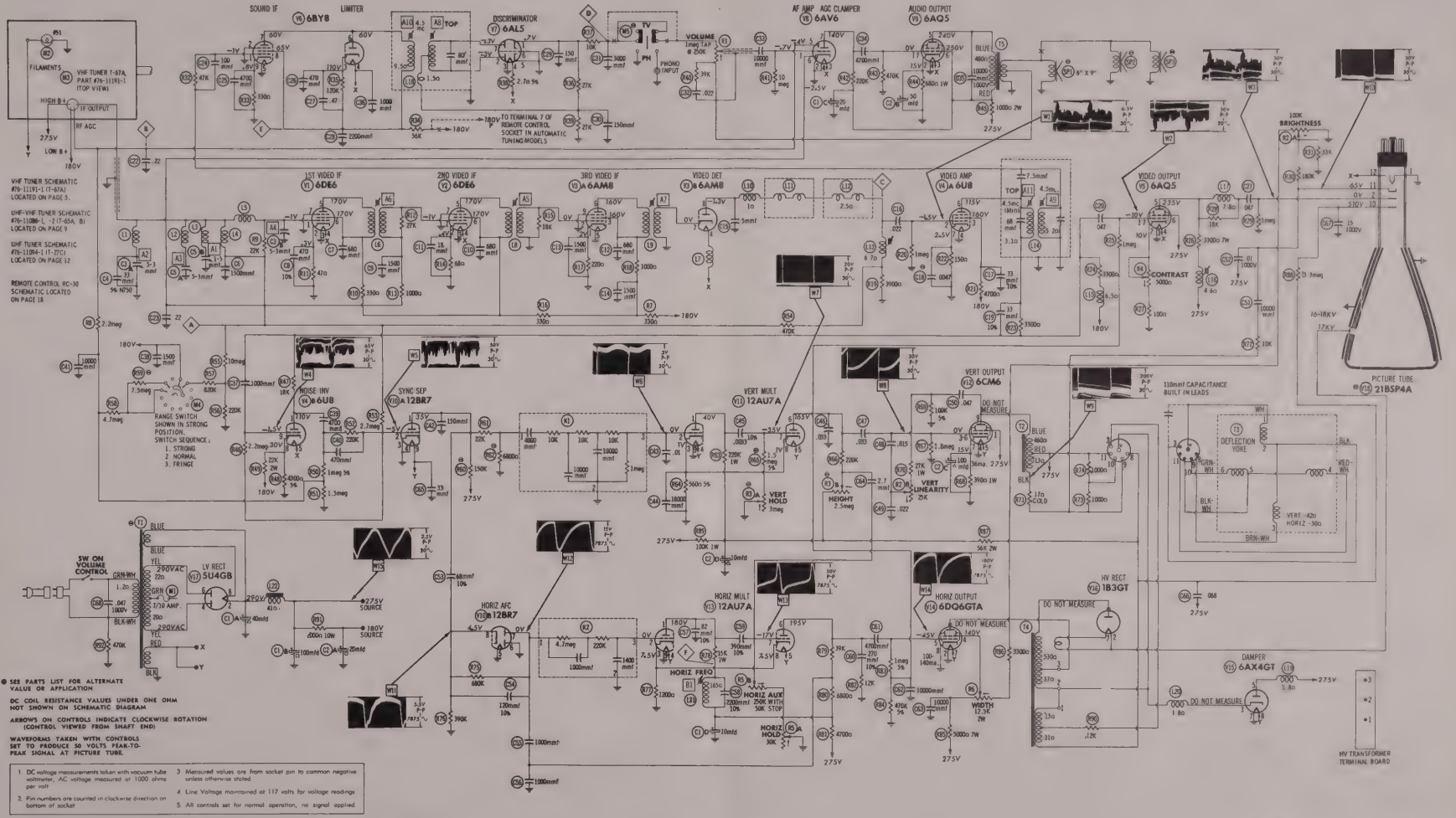


● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

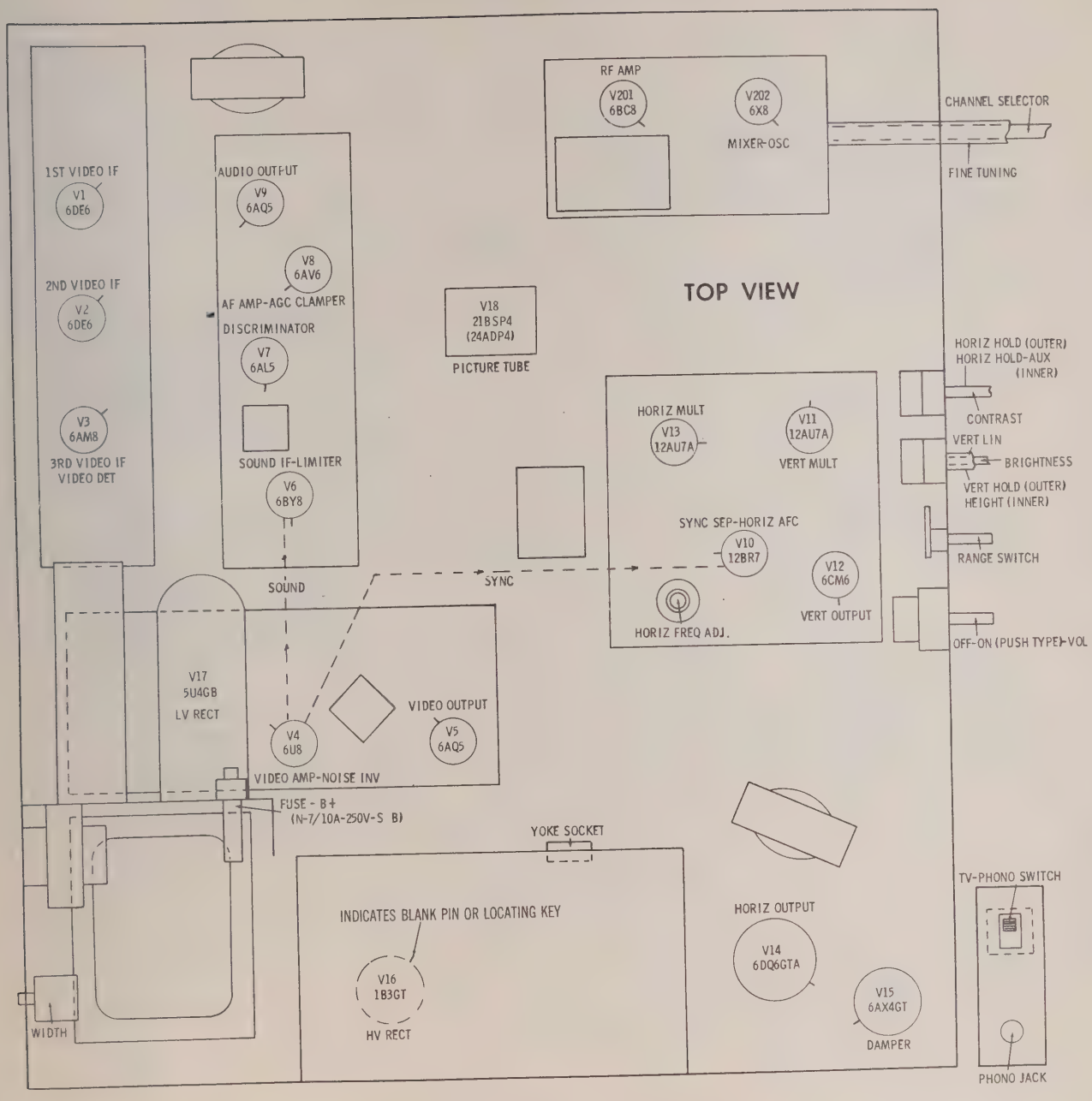
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L, F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

FOLDER 2

TUBE PLACEMENT CHART



PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L, F5624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (M1), V17

SWEEP FAILURE
No raster, has sound V10, V13, V14, V15, V16, V18
No vertical deflection V11, V12
Poor vert. linearity or foldover V11, V12
Poor horiz. linearity or foldover V13, V14, V15
Narrow picture V13, V14, V15, V17
Vert. off freq. V11
Horiz. off freq. V13

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V18
Has pic, no sound V6, V7, V8, V9

SYNC FAILURE
No vert. sync V4, V10
No horiz. sync V4, V10
No vert. or horiz. sync V4, V10

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point (A). Positive to chassis.
Connect the negative lead of a 2.5 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	Not used	45.75MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru 10K to point (C). Low side to chassis. (Across video det. load).	Mixer Plate Coil	Adjust for maximum 400∿ indication on scope.
2.	"	"	"	41.25MC	"	"	A1	Adjust for MINIMUM 400∿ indication on scope. Bias may be reduced as MINIMUM is approached.
3.	"	"	"	47.4MC	"	"	A2, A3	Adjust for MINIMUM 400∿ indication on scope. Bias may be reduced as MINIMUM is approached. Repeat steps 2 and 3.
4.	"	"	"	42.7MC	"	"	A4, A5	Reset bias to correct level. Adjust A4 and A5 for maximum 400∿ indication.
5.	"	"	"	45.0MC	"	"	A6	Adjust for maximum 400∿ indication.
6.	"	"	"	44.4MC	"	"	A7	"
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	65.75MC	4	"		Adjust fine tuning for MINIMUM 400∿ indication on scope.
8.	"	"	69MC (10MC Swp)	67.25MC 70.5MC	"	"		Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil to place 67.25MC marker at 50%. Position 70.5MC marker at 50% by retouching A5 and level top of curve with A7. DO NOT retouch A4 or A6.

SOUND IF ALIGNMENT

Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (C). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. It is possible to obtain 2 zero readings. Use the one with the slug farthest counterclockwise.
10.	"	"	"	"	DC probe to pin 3 (cathode) of 6BY8 (V6). Common to point (E).	A9, A10	Adjust for maximum deflection. Reduce the signal to keep reading below 40 volts. When adjusting A10 use peak furthest clockwise. Repeat step 9.

4.5MC TRAP ALIGNMENT

Use a 4.5MC tuned detector similar to Fig. 2. Before aligning trap, connect the detector to an accurate source of 4.5MC signal and adjust the coil slug for maximum DC voltage output.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001mfd	High side to point (C). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	DC probe thru detector probe (Fig. 2). Common to chassis.	All	Adjust for MINIMUM deflection on VTVM.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE6

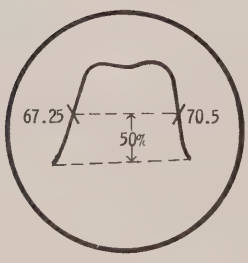


FIG. 1

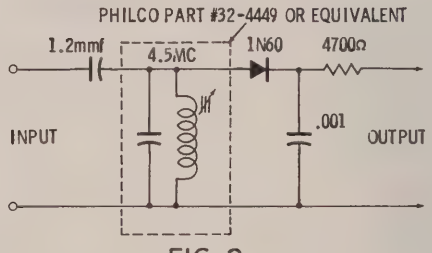
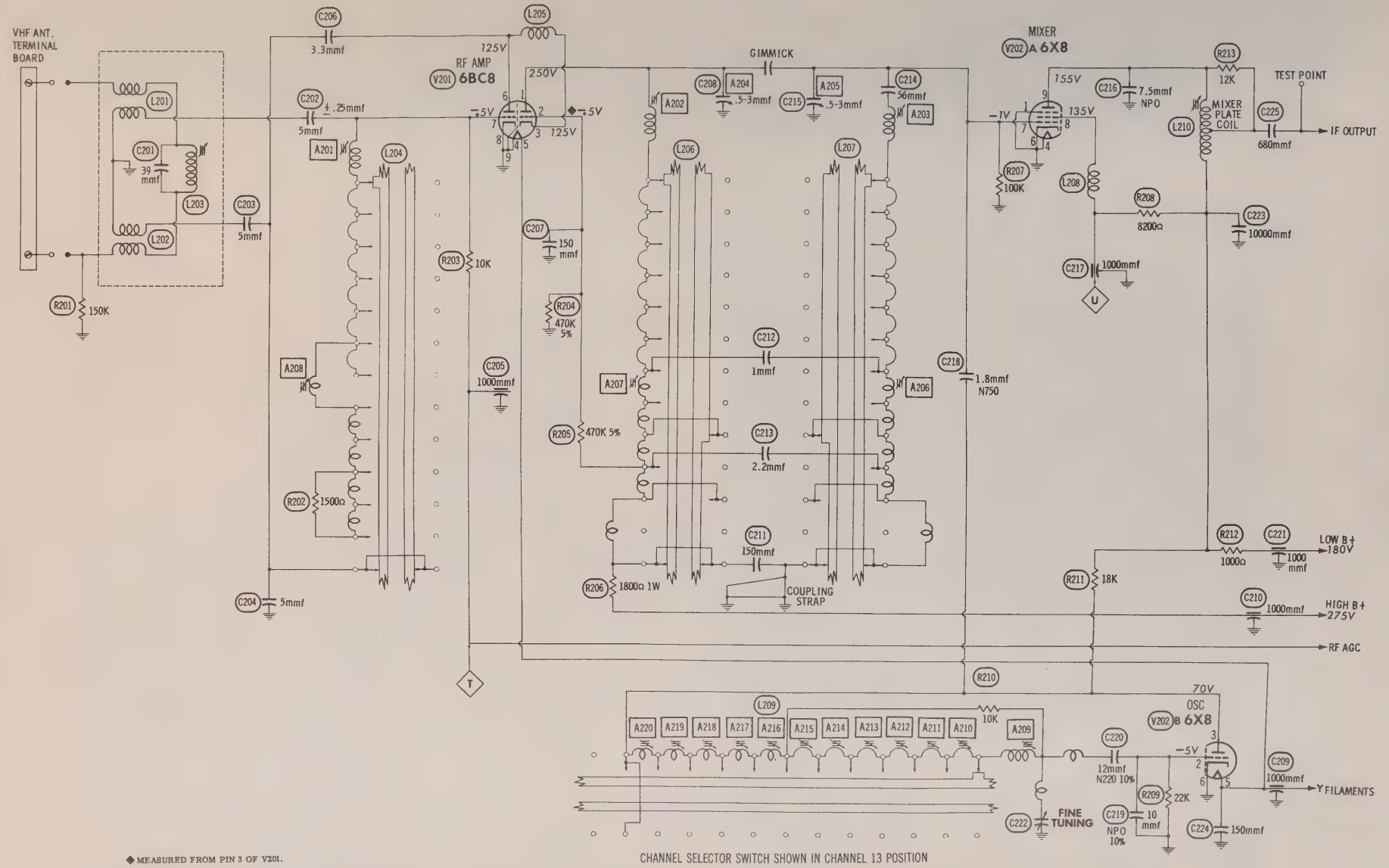


FIG. 2



◆MEASURED FROM PIN 3 OF V201.

CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER T-67A, PART #76-11191-1

VHF TUNER #76-11191-1 (T-67A)

PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L, F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #T-65A, B, T-67A

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Detune the Mixer Plate Coil by connecting a small capacitor (10 to 20mmf) across it.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC	210MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201	Adjust for maximum amplitude.
2.	"	"	"	211.25MC 215.75MC	"	"	A202, A203	Adjust for maximum gain and symmetry of response similar to Fig. 201. with markers as shown. Adjust A202 to set marker level. Adjust A203 for proper tilt.
3.	"	"	177MC	174.0MC 180.0MC	7	"	A204, A205	Adjust for tilt as shown in Fig. 202. Re-check step 2 and retouch, if necessary. Repeat step 3.
4.	"	"	85MC	82.0MC 85.0MC 88.0MC	6	"	A206, A207, A208	Turn A206 counterclockwise until single peak appears. Adjust A207 until peak falls at 85MC. Adjust A208 for maximum gain and symmetry of single peak. Retouch A206 and A207 for symmetrical response centered about 85MC.

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough Sweep Generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	Not used	209.75MC (400∿ 30% AM)	13	Across video detector load.	A209	Adjust for MINIMUM deflection.
				203.75MC	12		A210	
				197.75MC	11		A211	
				191.75MC	10		A212	
				185.75MC	9		A213	
				179.75MC	8		A214	
				173.75MC	7		A215	
				81.75MC	6		A216	
				75.75MC	5		A217	
				65.75MC	4		A218	
				59.75MC	3		A219	
				53.75MC	2		A220	

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

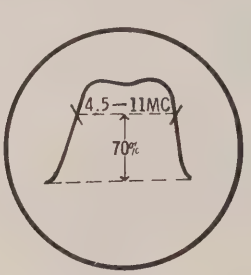


FIG.201

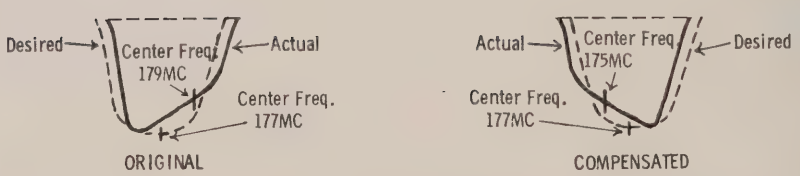
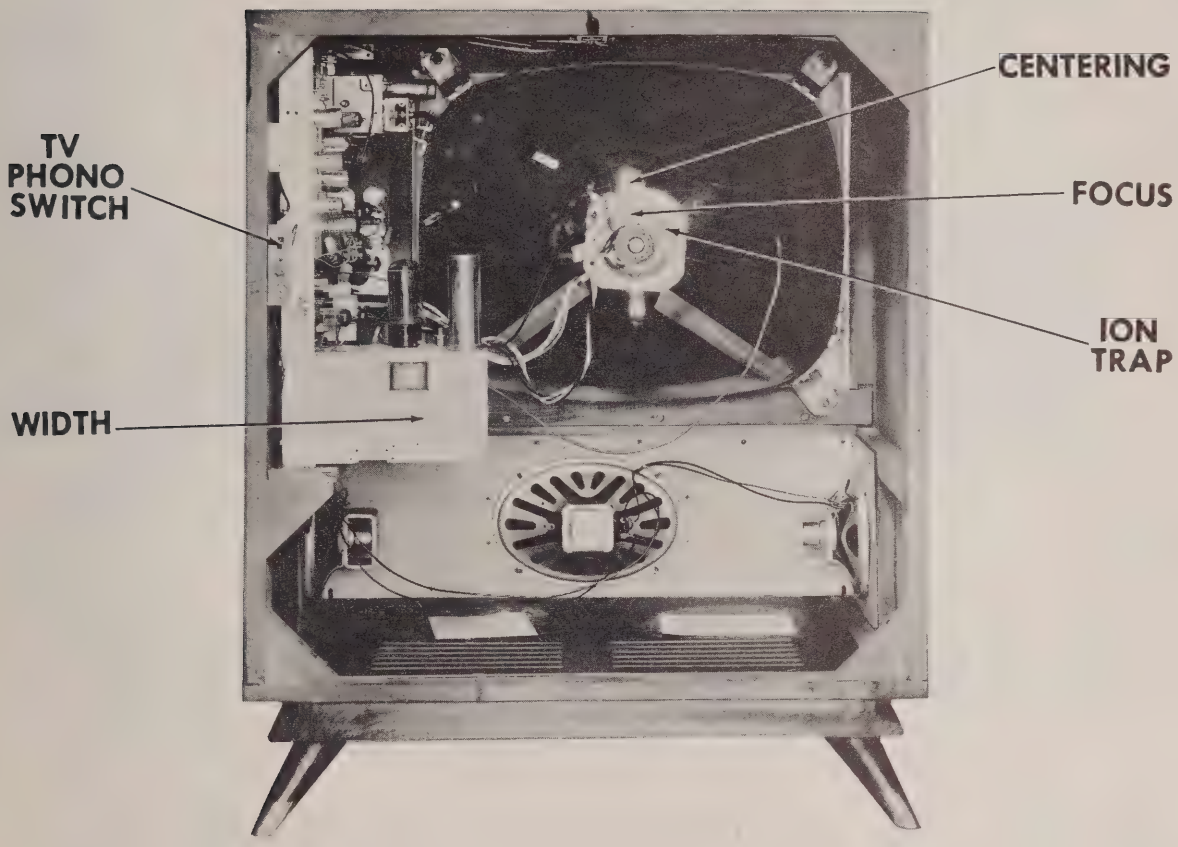


FIG.202



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station, preferably with a test pattern.

Turn the Contrast control counterclockwise until the blanking is visible. Set the Horizontal Hold control (R5A) to the center of its range.

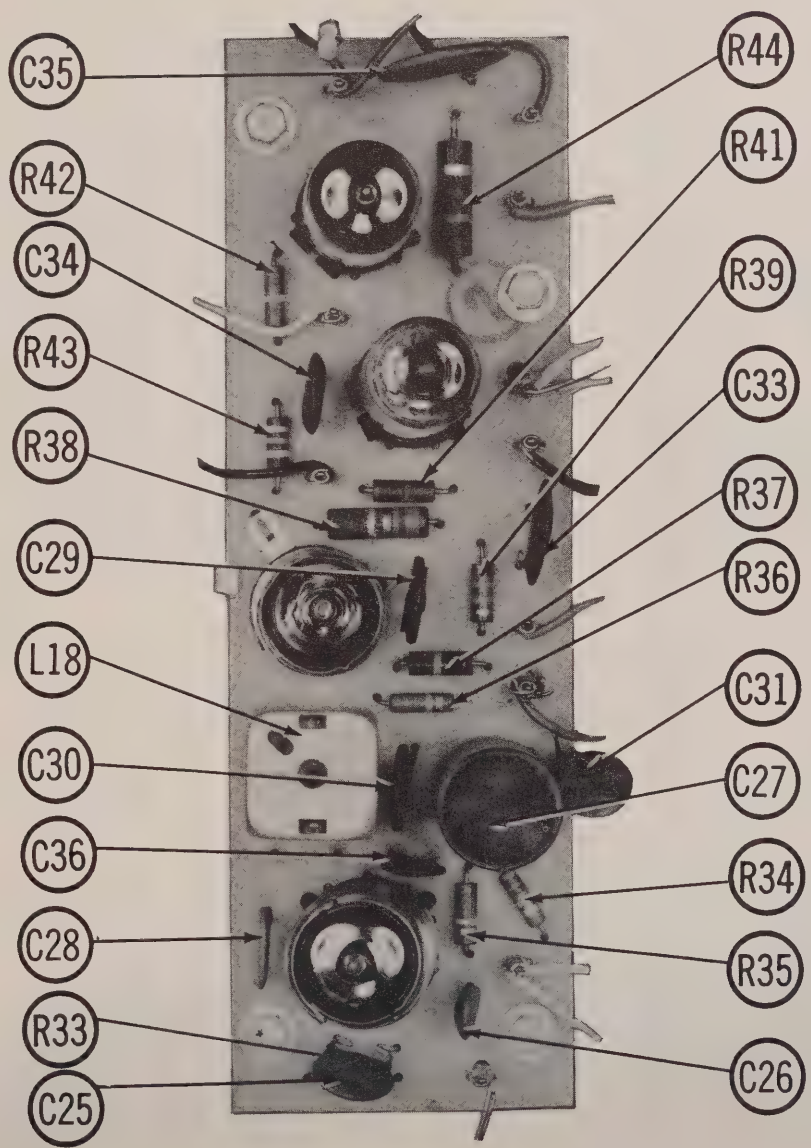
Short out the Horizontal Frequency coil (L21) by connecting a .1mfd capacitor from point ⟨F⟩ to chassis.

Adjust the Aux. Horizontal Hold control (R5B) until equal blanking appears on either side of the raster. Check by moving the picture first to one side, then the other, with the centering device.

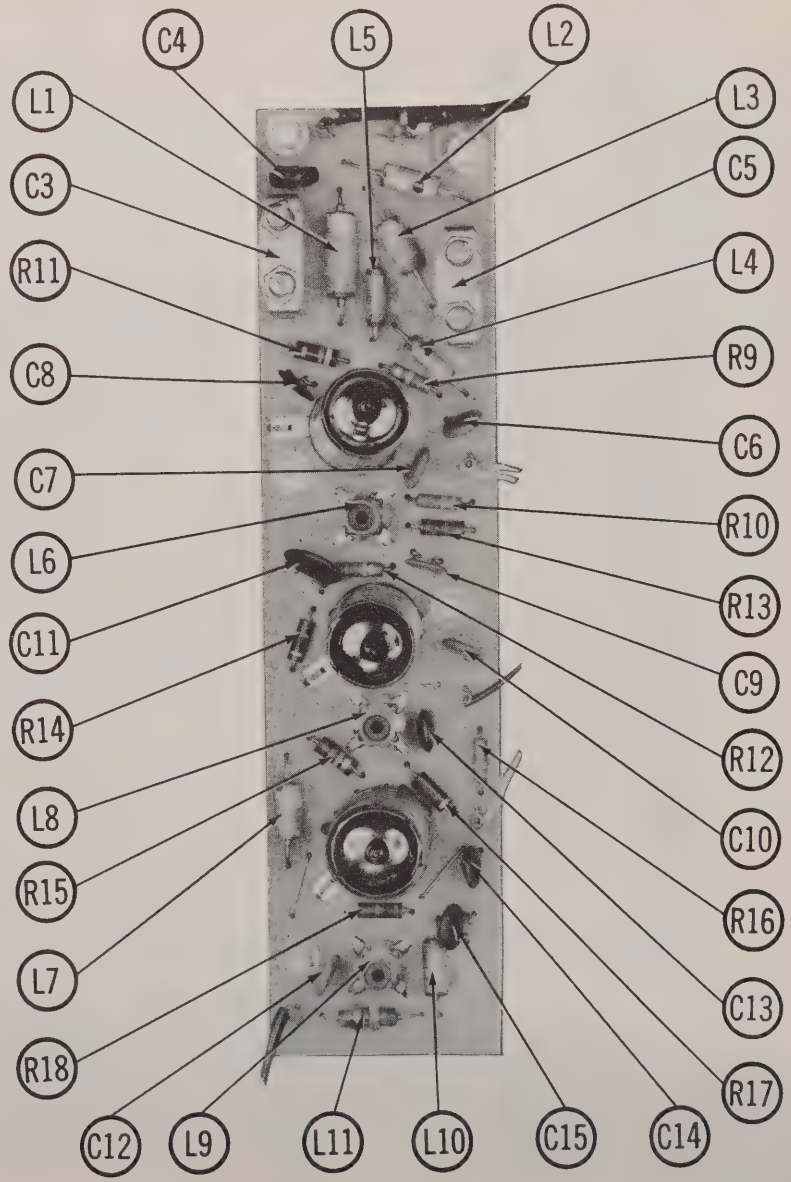
Remove the shorting capacitor. Adjust the Horizontal Frequency slug (B1) until the picture is brought into sync with equal blanking on either side of the raster.

Check the pull-in by turning the Horizontal Hold control until the picture falls out of sync and then slowly bring the picture back into sync. This pull-in point should occur with between $2\frac{1}{2}$ and 3 bars present. If pull-in is not correct, repeat above adjustments.

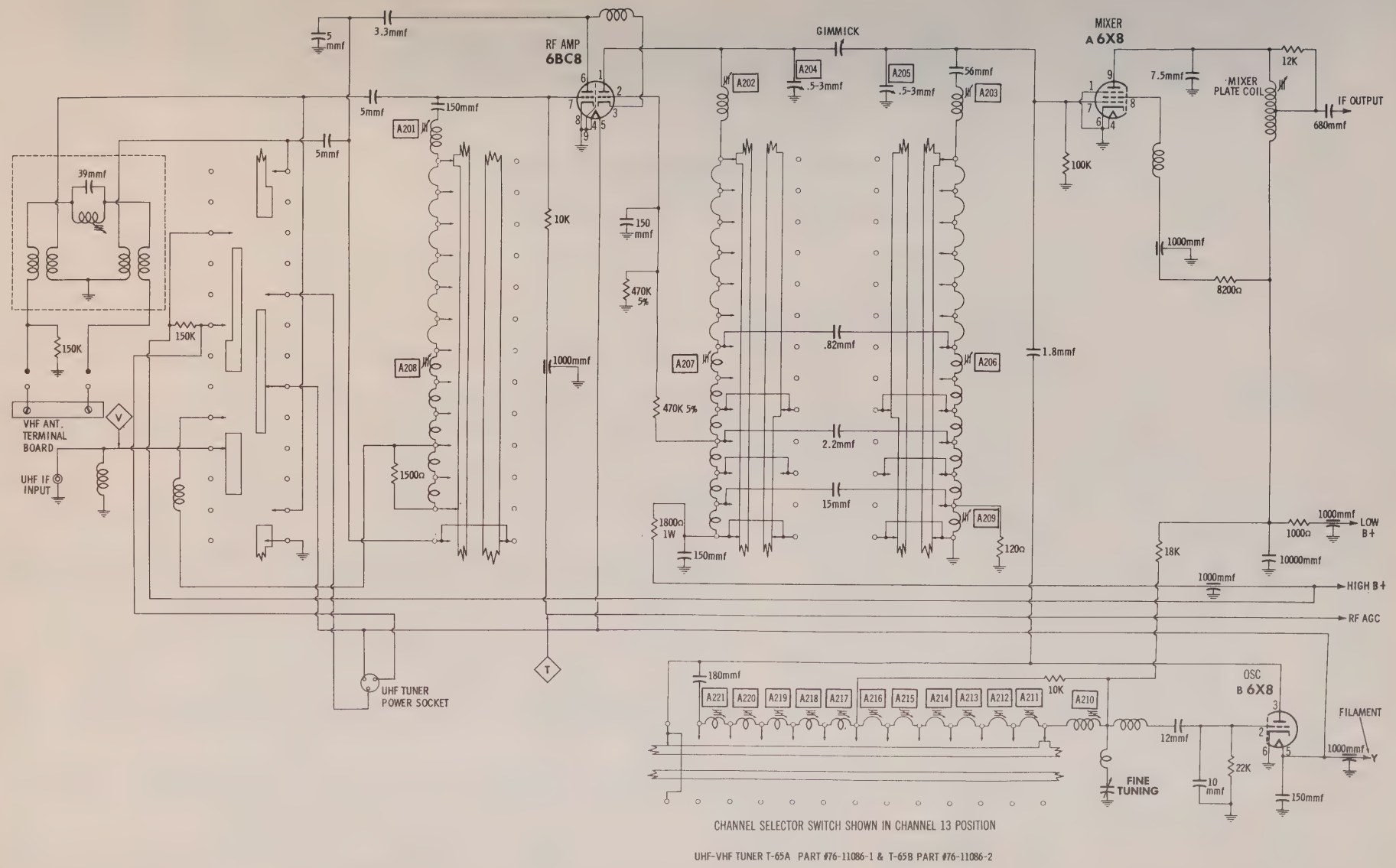
Adjust the Width control (R6) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.



SOUND PRINTED BOARD



VIDEO IF PRINTED BOARD



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

UHF-VHF TUNER T-65A PART #76-11086-1 & T-65B PART #76-11086-2

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF -VHF TUNER #76-11086-1, -2 (T-65A, B)

PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L,
F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L,
UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6DE6	
V2	2nd Video IF Amp	6DE6	
V3	3rd Video IF Amp - Video Det	6AM6	
V4	Video Amp - Noise Inv	6U8	
V5	Video Output	6AQ5	
V6	Sound IF Amp - Limiter	6BY8	
V7	Discriminator	6AL5	
V8	AF Amp -AGC Clamper	6AV6	
V9	Audio Output	6AQ5	
V10	Sync Sep. -Horiz. AFC	12BH7	
V11	Vert. Mult.	12AU7A	
V12	Vert. Output	6CM6	
V13	Horiz. Mult.	12AU7A	
V14	Horiz. Output	6DQ6GTA	
V15	Damper	6AX4GT	
V16	HV Rectifier	1B3GT	
V17	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: PHILCO Part No.	GENERAL ELECTRIC Part No.	RCA Part No.	SYLVANIA Part No.	NOTES
V18	21BSP4	21ACP4A/ 21AMP4A/ 21BSP4 ① 24CP4A/ 24AMP4A/ 24TP4/ 24VP4A/ 24CP4-A/ 24AMP4 ①	21ACP4A/ 21AMP4A/ 21ASP4 ② 24ADP4/ 24CP4A/ 24VP4A/ 24ADP4/ 24TP4 ②	① "Aluminized" ② "Silverama" ③ ③ "Silver Screen 85"	
	24ADP4				

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1A	40	400	30-2590-13	AFH4-94-75	D0160	FP425.6	TMQ-17	Q-030	*R2523
B	100	350			BR10035		TD-100-450	MTD-4540	
C	20	350							
D	10	350							
C2A	40	350	30-2590-22	AFH4-113-10		FP452.5			*R2651
B	50	25							
C	100	25							
D	10	475							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C3A	.5-3		31-6535-1						
B	.5-3		31-6535-1		DTN-33				N750 5%
C4	33		30-1263-3						
C5A	.5-3		31-6535-1						
B	1-5		31-6535-2						
C6	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C7	680		30-1262-15	BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C8	470		30-1262-18		D8-471	5R5T47			10%
C9	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C10	680		30-1262-15	BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C11	18		30-1263-2	81 18	D8-180	LT8Q18	UC-5318	5GA-Q18	
C12	680		30-1262-15	BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C13	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C14	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C15	5		30-1263	DF-5	DD-050	L10Y5	ZT-555	5GA-Y5	
C16	.022	600	30-4685-60	P588N-022		BC5S22	ACE612	6SE-S22	
C17	33		30-1263-8	NPO-DI 33	DD-330	L10Q33	ZT-5433	5TCC-Q33	10%
C18	.0047	200		P288N-0047		BC5D47J	ACE6247	4SE-S47	①
C19	33		30-1263-8	NPO-DI 33	DD-330	L10Q33	ZT-5433	5TCC-Q33	10%
C20	.047	400	30-4684-45	P488N-047		BC5S47J	ACE6147	4SE-S47	
C21	.047	400	30-4684-45	P488N-047		BC5S47J	ACE6147	4SE-S47	
C22	.22	400	30-4650-49	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C23	.22	400	30-4650-49	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C24	100		62-10009001	81 100	D8-101	L7ST1	UC-531	5GA-T1	
C25	4700		30-1262-2	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C26	470		30-1262-16	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C27	.47	300	30-4685-34	P288N-47		BC5P47J		3SE-P47	
C28	2200		30-1263-7	BPD-0022	DD-222	BYA10D22	UC-5322	5GA-D22	
C29	150		30-1262-28	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C30	150		30-1262-28	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C31	3000		30-1238-16	BPD-003	DD-302	BYA10D3	UC-523	5GA-D3	
C32	.022	200	30-4650-43	P288N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C33	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C34	4700		30-1262-2	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C35	10000	1000	30-1269-1	DAC-27	DD6-103	BYA10S1		BL-S10	
C36	1000		30-1262-12	BPD-001	DD-102	BYA6D1	DC541	5HK-D1	
C37	1000		30-1262-14	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C38	1500		30-1238-15	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C39	4700		30-1262-2	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C40	470		30-1262-17	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C41	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C42	150		30-1262-28	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C43	.01	400	30-4650-41	P488N-01	DE-103	CUB4S1	GEM-4S1	4TM-S1	
C44	18000		30-1262-36						
C45	.0033	400	30-4650-55				GEM-16333		10%
C46	.033	400	30-4650-44	P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C47	.033	400	30-4650-44	P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C48	.015	200	30-4650-43	P488N-015	DD6-153	CUB4S15	GEM-4115	4TM-S15	
C49	.022	400	30-4650-43	P488N-022	DD-303	CUB4S22	GEM-4122	4TM-S22	
C50	.047	600	30-4650-52	P688N-047	DF-503	CUB6S47	GEM-5147	6TM-S47	
C51	10000		30-1238-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C52	.01	1000	30-4650-92	P1088N-01		CUB10S1	GEM-1011	10TM-S1	
C53	68		30-1263-4	NPO-DI 68	DD-680	L10Q68		MS-S68	10%
C54	120		30-1264-5	NPO-DI 120	DD-.21	L10T12		MS-S12	10%
C55	1000		30-1262-12	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C56	1000		30-1262-12	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C57	82		30-1264	1469-000082	D8-820	5R5Q2		MS-482	10%
C58	2200		30-1264-4	1464-0022		1R5D22		MS-322	10%
C59	390		30-1264-1	1469-00039	D6-391	5R5T39		MS-339	10%
C60	270		30-1264-17	1469-00027	D6-271	5R5T27		MS-327	10%
C61	4700		30-1262-2	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C62	10000		30-1238-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C63	10000		30-1238-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C64	2.7		30-1221-18						
C65	33		62-03300001	SI 33	D6-330	L76Q33	UC-5433	5GA-Q33	
C66	.068	400	30-4650-48	P488N-068		CUB4S68	GEM-4168	4TM-S68	
C67	.15	1000	30-4671-99	P1088N-15		CUB10P15	GEM-10015	10TM-P15	
C68	.047	1000	30-4660-96	P1088N-047		CUB10S47	GEM-10147	10TM-S47	

② Some versions use .0039mfd in this application (Part #30-4688-1).

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: PHILCO Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1meg		33-5588-8					Volume - Tap ③ 250K
B	Switch							
R2A	100K		33-5573-29	F1-31		⋆ (QJ-1065	UE1141	Brightness
B	25K			R2-27			Not Req.	Vert. Lin.
R3A	3meg		33-5573-28	F1-78		# ⋆ (QJ-932	UE3254	Vert. Hold - Note 1
B	2.5meg			R2-76			Not Req.	Height - Note 1
R4	5000Ω		33-5587-20			† QJ-1066		Contrast
R5A	30K		33-5573-40	F1-38		‡ ⋆ (QJ-963	UE1632 ⋆	Horiz. Hold
B	250K			R3-34 ⋆			Not Req.	Horiz. Aux. with 50K stop
R6A	12.5K	2(WW)	33-5574-3	WN-153		WU-217		Width
B	Shaft			Not Req.		SK5		

⋆ "Concentrikit" Equivalent: K15-Kit, Base Elements & Shafts — B11-128, P13-128 (Panel); B11-120, R15-005 (Rear)

‡ "Concentrikit" Equivalent: K15-Kit, Base Elements & Shafts — B11-140, P13-128 (Panel); B11-339, R15-005 (Rear)

● Not available as a factory assembled control.

† "Concentrikit" Equivalent: K15-Kit, Base Elements & Shafts — B17-114, P13-128

§ "Concentrikit" Equivalent: K6-Kit, Base Elements & Shafts — B11-121, P13-128 (Panel); B11-326, R15-005 (Rear) ⋆

⋆ Use 47K resistor in series with the right hand terminal of the rear section.

Note 1. Chassis stamped Run 3 use 2meg and 2.5meg controls in this application (Part #33-5573-42).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	PHILCO Part No.	NOTES
R7	330Ω		66-1338340	
R8	2.2meg		66-5228340	
R9	22K		66-2228340	
R10	33Ω		66-1338340	
R11	47Ω		66-0478340	
R12	27K		66-2278340	
R13	100Ω		66-1108340	
R14	68Ω		66-0688340	
R15	18K		66-3188340	
R16	330Ω		66-1338340	
R17	220Ω		66-1228340	
R18	1000Ω		66-2108340	
R19	3900Ω		66-2398340	
R20	1meg		66-5108340	
R21	4700Ω		66-2478340	
R22	150Ω		66-1158340	
R23	3300Ω		66-2338340	
R24	3300Ω		66-2338340	
R25	1meg		66-5108340	
R26	3300Ω	7	33-3449-1	
R27	100Ω		66-1108340	
R28	18K		66-3188340	
R29	1meg		66-5108340	
R30	180K		66-4188340	
R31	33K		66-3338340	
R32	47K		66-3478340	
R33	330Ω		66-1338340	
R34	56K		66-3568340	
R35	120K		66-4128340	
R36	27K		66-3278340	
R37	10K		66-3108340	
R38	2.7Ω 5%		66-9273340	
R39	27K		66-3278340	
R40	39K		66-3398340	
R41	10meg		66-6108340	
R42	220K		66-4228340	
R43	470K		66-4478340	
R44	680Ω	1	66-1684340	
R45	1000Ω	2	66-2108340	
R46	2.2meg		66-5228340	
R47	18K		66-3188340	
R48	43000 5%		66-2433340	
R49	22K	3	66-2228340	
R50	1meg 5%		66-5108240	
R51	1.5meg		66-5158340	
R52	220K		66-4228340	
R53	2.7meg		66-5278340	
R54	470K		66-4478340	
R55	10meg		66-6108340	
R56	220K		66-4228340	
R57	820K		66-4828340	
R58	4.7meg		66-5478340	
R59	7.5meg		66-5758340	Note 1
R60	150K		66-4158340	Note 3
R61	22K		66-3228340	
R62	6800Ω		66-2688340	Note 3
R63	220K	1	66-4228340	
R64	560Ω 5%		66-1568240	
R65	1.5meg 5%		66-5158240	Note 4
R66	220K		66-4228340	
R67	1.8meg		66-5188340	
R68	390Ω	1	66-1394340	
R69	100K 5%	1	66-4104240	
R70	27K	1	66-3274340	
R71	17Ω Cold		33-1548-8	Note 5
R72	10K		66-3108340	
R73	1000Ω		66-2108340	
R74	1000Ω		66-2108340	
R75	680K		66-4688340	
R76	390K		66-4398340	
R77	1200Ω		66-2128340	
R78	15K	1	66-3154340	
R79	39K		66-3398340	
R80	6800Ω		66-2688340	
R81	4700Ω		66-2478340	
R82	12K		66-3128340	
R83	1meg 5%		66-5108240	
R84	470K 5%		66-4478240	
R85	5000Ω	7	33-1335-18	
R86	3300Ω		66-2338340	
R87	56K	2	66-3568340	
R88	3.3meg		66-5338340	
R89	100K	1	66-4104340	
R90	12K		66-3128340	
R91	2000Ω	10	33-3363-5	
R92	470K		66-4478340	

Note 1. Some versions may use 5.6meg in this application (Part #66-5568340).
Note 2. Chassis stamped Run 3 use 120K in this application (Part #66-4128340).
Note 3. Chassis stamped Run 3 use 82000 in this application (Part #66-2828340).
Note 4. Chassis stamped Run 3 use 2.2meg 5% in this application (Part #66-5228240).
Note 5. Temperature compensating resistor.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T1	117V @1.9A	560VCT @.310A	5V @2.56A	32-8806-1 ①						
	SEC. 3	SEC. 4	SEC 5							
	6.3V @8 6A									

① Ch. 8L72, U use Part #32-8801-1 in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T2	Vert. Output	32-8802-1			A-8821	A-8147			
T3A	Yoke-Horiz.(20MH)	76-10118-2 ①	DF607②	A-2821	MDF-92②	DY-16A ②	Y-16 ③	Y-41 ②	
B	(90°) Vert. (47MH)				Y90P19/43 ③				
T4	Horiz. Output	32-8799-1 ③							

① Includes cable assembly.
② Use original damping network and original yoke plug and leads; connect same as original.
③ Includes L19.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T5	10000Ω	3-4Ω	32-8825-1							
	Turns Ratio									
		Sec tap to low side								
	20: 1									

● Not available as a factory assembled control.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: PHILCO Part No.	QUAM Part No.	NOTES
SP1	6" x 9"	PM	8-10Ω	36-1631-14 ①	69AIZ9.5	① Used in Models F4626, L, UF4626, L, F4627, L, UF4627, L, F6624T, TL, UF6624T, TL
SP2	6"	PM	8-10Ω	36-1641-28 ②	6AIZ9	② Used in Models F4626M, UF4626M
SP3	6"	PM	8-10Ω	36-1641-29 ①	6LEIZ9	③ Used in Models F4623, UF4623
	6"	PM	6-8Ω	36-1663-5 ③	6AIZ8	④ Used in Models F4216, L, UF4216, L
	7½"	PM	6-8Ω	36-1661-16 ④	8AIZ6	
				36-1633-6 ④		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: PHILCO Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Ram Part No.	NOTES
L1	47.4MC Trap Coil	32-4645-3	19-1001	BC-563	4604		1.5 Microhenries
L2	47.4MC Trap Coil	32-4645-19	19-1003	BC-563	4606		3.6 Microhenries
L3	41.25MC Trap Coil	32-4645-17					3 Microhenries
L4	RF Choke	32-4645-30			4584		.33 Microhenry
L5	1st. Video IF Coil	32-4645-2					.98 Microhenry
L6	2nd. Video IF	32-4656-3					
L7	Fil. Choke	32-4645-18					2.1 Microhenries
L8	3rd. Video IF	32-4686-3					
L9	4th. Video IF	32-4686-3					
L10	Resonant Choke	32-4645-7					3 Microhenries
L11	RF Choke	32-4674-1	19-6023	TV-192	6153		33 Microhenries
L12	Resonant Choke	32-4610-20					2.3 Microhenries, IRC Part #CLA
							75-250 Microhenries Includes Cups.
L13	Shunt Peaking Coil	32-4694-4					
L14A	4.5MC Trap	32-4688-5					
B	Sound IF						150 Microhenries
L15	Shunt Peaking Coil	32-4690-8	19-3160	TV-196	6130		45-150 Microhenries
L16	Shunt Peaking Coil	32-4694-10					230 Microhenries
L17	Series Peaking Coil	32-4690-7	19-3350	TV-195	6154		Tertiary - 1.5Ω
L18	Discriminator	32-4735					90MC, .81 Microhenry
L19	Resonant Choke	32-4112-43					80MC, .61 Microhenry
L20	Resonant Choke	32-4112-43					

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: PHILCO Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Ram Part No.	Thordarson Part No.	NOTES
L21	165Ω		32-4672-5						

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
L22	.365A	41Ω	1.3 Hy.	32-8710					26C44	C-23X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO Part No.	REPLACEMENT DATA
K1	Vert. Integrator	4000mmf, 10000mmf, 10000mmf, 10K, 10K, 10K, 1meg	30-8008-1	Centralab PC-306
K2	Horiz. Coupling	1000mmf, 14500mmf, 4.7meg, 220K	30-8008-4	Centralab PC-307

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: PHILCO Part No. FUSE	PHILCO Part No. HOLDER	LITTELFUSE Part No. FUSE	LITTELFUSE Part No. HOLDER	BUSS Part No FUSE	BUSS Part No HOLDER
M1	N	7/10A 125V 8/B	27-6318-1	27-6317-1	335.750 (N 3/4A-125V 8/B)	346010	N 7/10	HN 1/3 to 3/4

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO Part No.	NOTES
M2	Lamp	34-3040	#51
M3	Tuner	76-11191-1	VHF (T-87A) Ch. 8L71, 8L73
	Tuner	76-11088-1	UHF-VHF (T-86A) Ch. 8L71U, 8L73U
	Tuner	76-11088-3	UHF-VHF (T-86B) Ch. 8L73, U
	Tuner	76-11094-1	UHF (T-87C) Ch. 8L71U, 8L73U, 8L73U
M4	Switch	42-2063-1	Range
M5	Switch	42-2075-4	TV-Phono Ch. 8L72, U, 8L73, U
M6	Focus Magnet	76-11134-1	Includes centering magnet #54-6349, Ch. 8L71, U, 8L73, U
	Focus Magnet	76-10119-2	Ch. 8L72, U
M7	Ion Trap	76-8077-2	
	Printed Board	54-9826	IF, Board only
	Printed Board	54-9853-1	Video, Board only
	Printed Board	54-5354	Sound, Board only
	Printed Board	54-5355	Osc., Board only

PHILCO MODELS F4216, L, F4623, F4626 L, M, F4627, L, F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

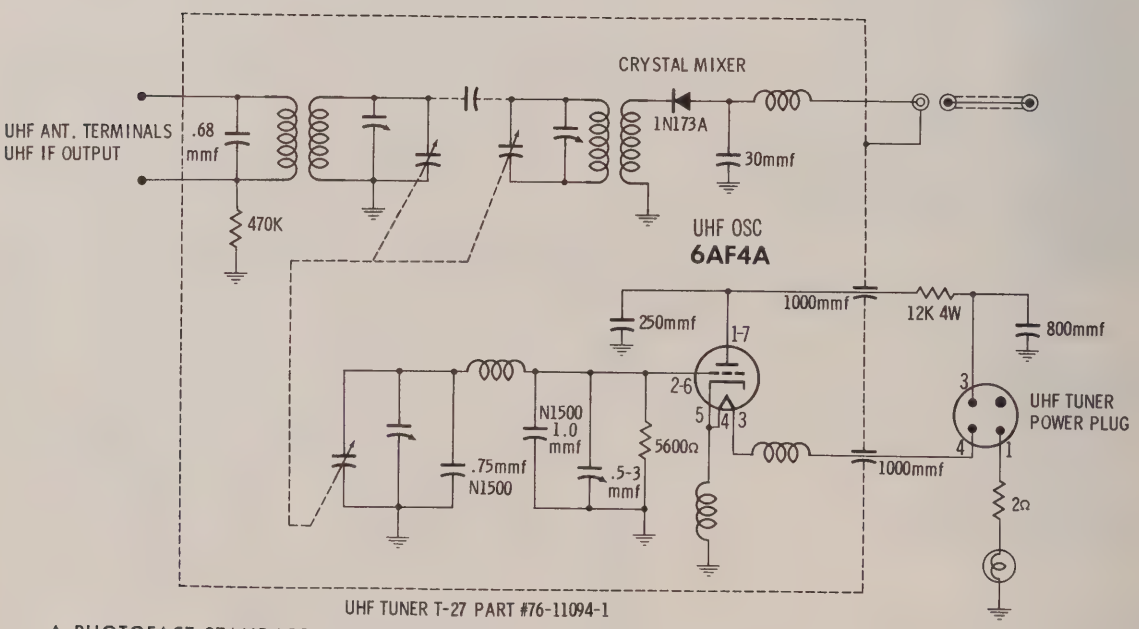
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	54-9213-68	Models F6624T, TL, UF6624T, TL
Safety Glass	54-9213-69	Models F4216, L, F4626, L, M, UF4626, L, M, F4623, UF4623, F4627, L, UF4627, L
Safety Glass	54-9213	Models UF4216, L
Mask	54-6431-3	Models F6624T, UF4624T
Mask	54-6431-1	Models F6624TL, UF6624TL
Mask	54-6296-1	Models F4216, L, UF4216, F4627L, UF4627L
Mask	54-6296-4	Models F4626, L, UF4626, L, F4627, UF4627
Mask	54-6481-1	Models F4623, UF4623
Mask	54-5308	Light, Models F4623, UF4623, F4216, L, UF4216, L, F4626, L, UF4626, L
Mask	54-5308-1	Light, Model UF4627
Bezel	54-5281-2	Models F4216, L, UF4216, L, F4623, UF4623, F4627, L, UF4627L
Bezel	54-5281-1	Models F4626, L, UF4626, L
Knob	54-6300-5	Brightness, Contrast, Horiz. & Vert. Hold, Models F6624T, UF6624T, F4216, L, UF4216, L, F4626, L, M, UF4626, L, M, F4627, UF4627
Knob	54-6300-1	Brightness, Contrast, Horiz. & Vert. Hold, On-Off-Volume, Models F6624TL, UF6624TL, F4627L, UF4627L, F4623, UF4623
Knob	54-6481-1	On-Off-Volume, Models F6624T, TL, UF6624T, TL, F4216, L, UF4216, L, F4626, L, M, UF4626, L, M, F4627, L, UF4627, L
Knob	54-6135-3	Channel Selector, Models F6624T, TL, UF6624T, TL
Knob	28-11353-1	Channel Selector, Models F4216, L, UF4216, L, F4626, L, M, UF4626, L, M, F4623, UF4623, F4627, L, UF4627, L
Knob	54-6482-1	Fine Tuning, Models F6624T, UF6624T
Knob	54-6482-2	Fine Tuning, Models F6624TL, UF6624TL
Knob	54-6297-3	Fine Tuning, Models F4216, L, UF4216, L, F4626, L, M, UF4626, L, M, F4623, UF4623, F4627, L, UF4627, L
Knob	54-6483-1	Range, Models F6624T, UF6624T, F4216, L, UF4216, L, F4626, L, M, UF4626, L, M, F4627, UF4627
Knob	54-6483-2	Range, Models F6624TL, UF6624TL, F4623, UF4623, F4627L, UF4627L
Knob	76-10207-1	UHF Drive & Knob Assy., Models UF4216, L, UF4626, L, M, UF4623
Knob	76-10210-1	UHF Tuning, Model UF4627
Knob	54-4338-2	Antenna

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

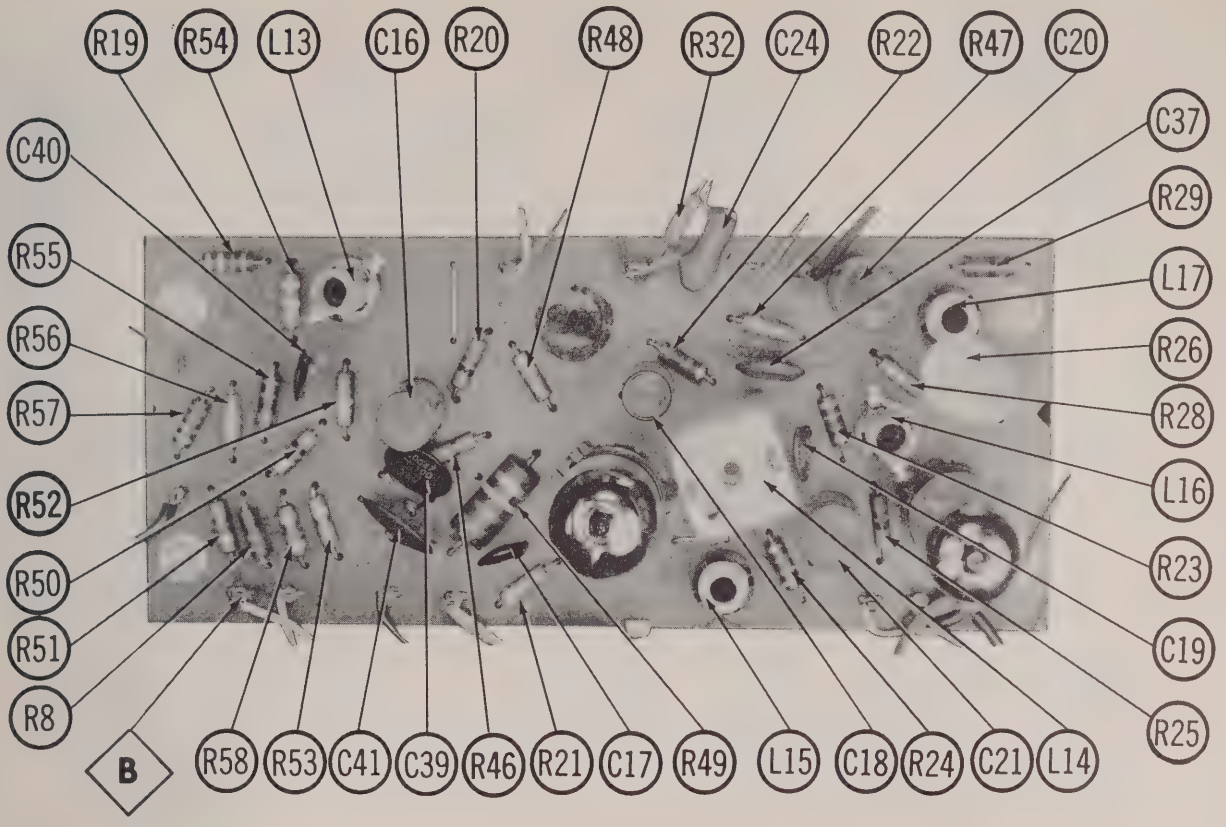


UHF TUNER T-27 PART #76-11094-1

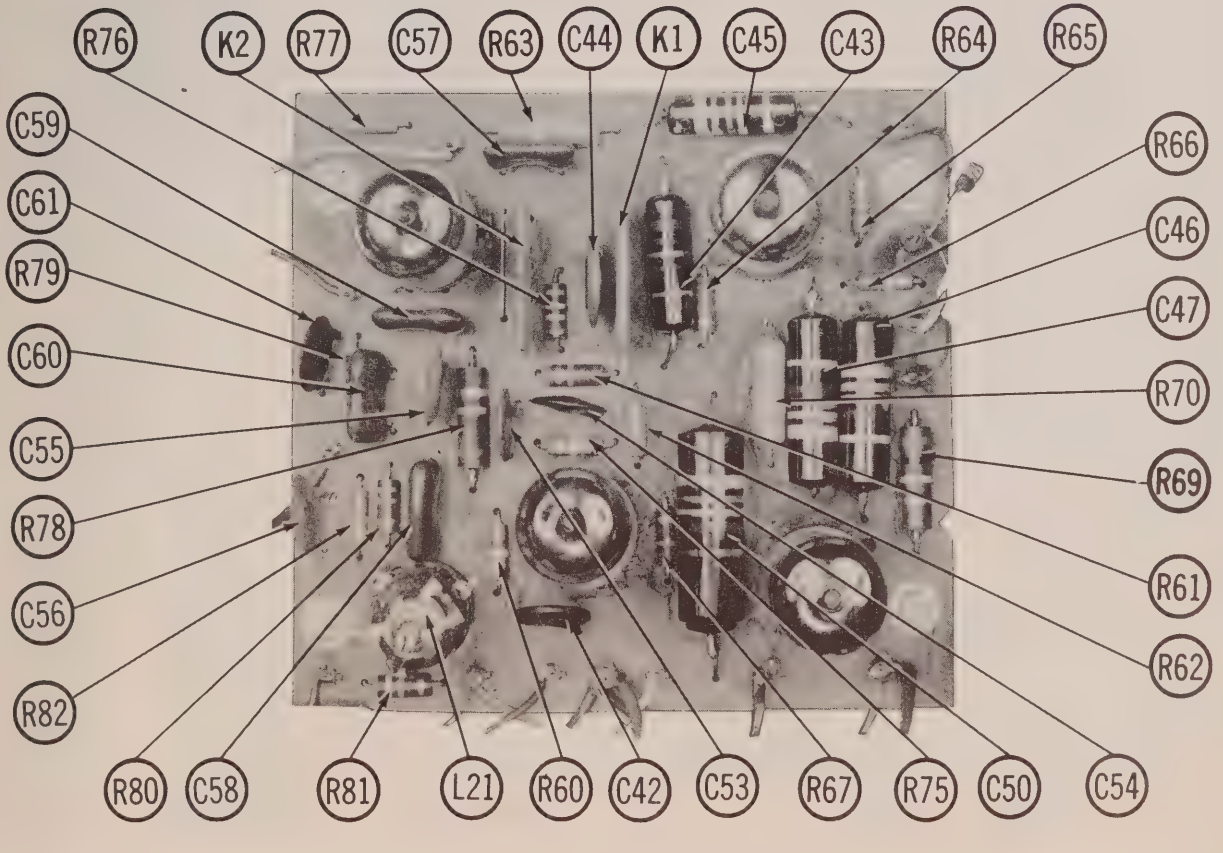
A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

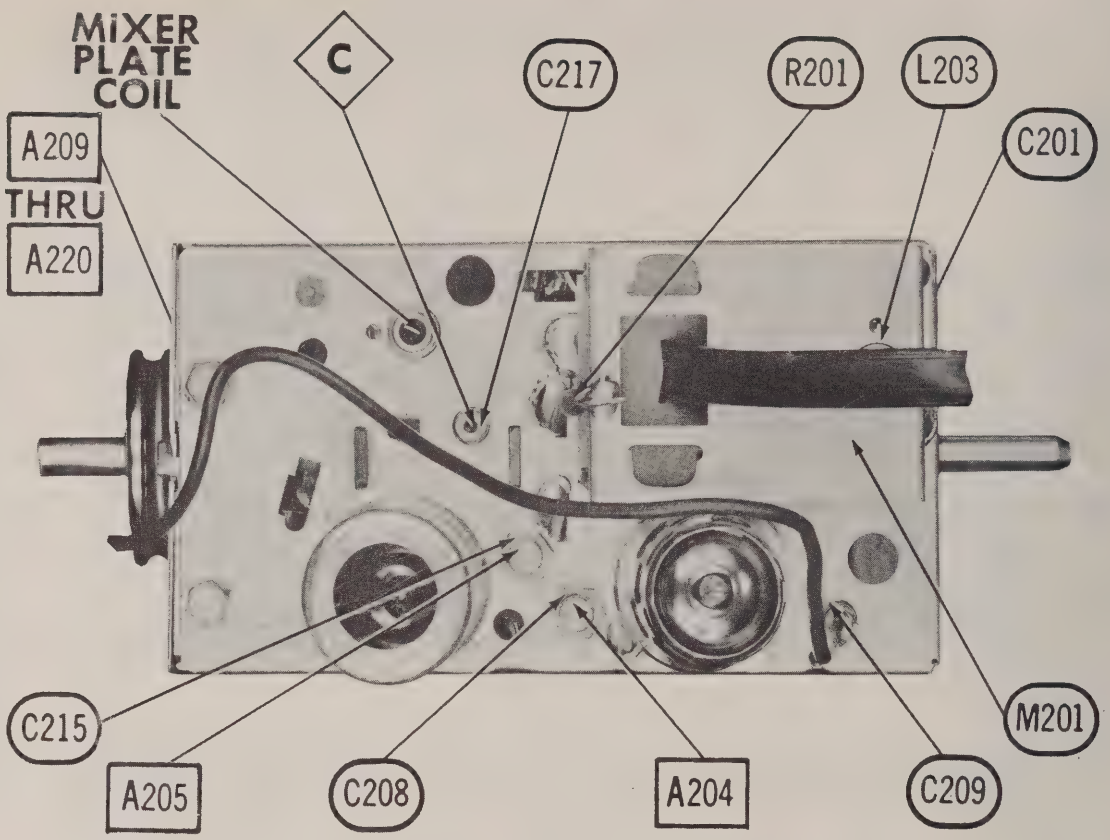
UHF TUNER SCHEMATIC



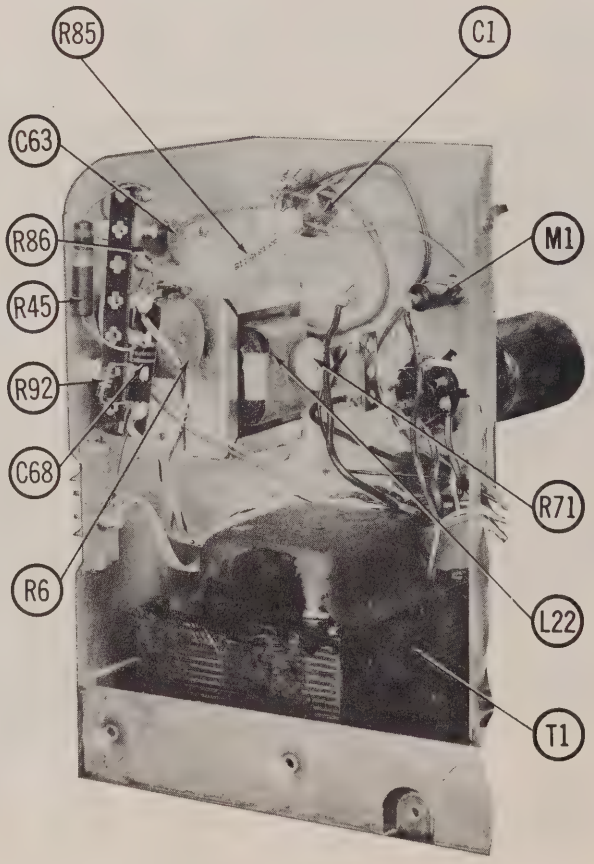
SWEEP PRINTED BOARD



VIDEO PRINTED BOARD



RF TUNER-TOP VIEW



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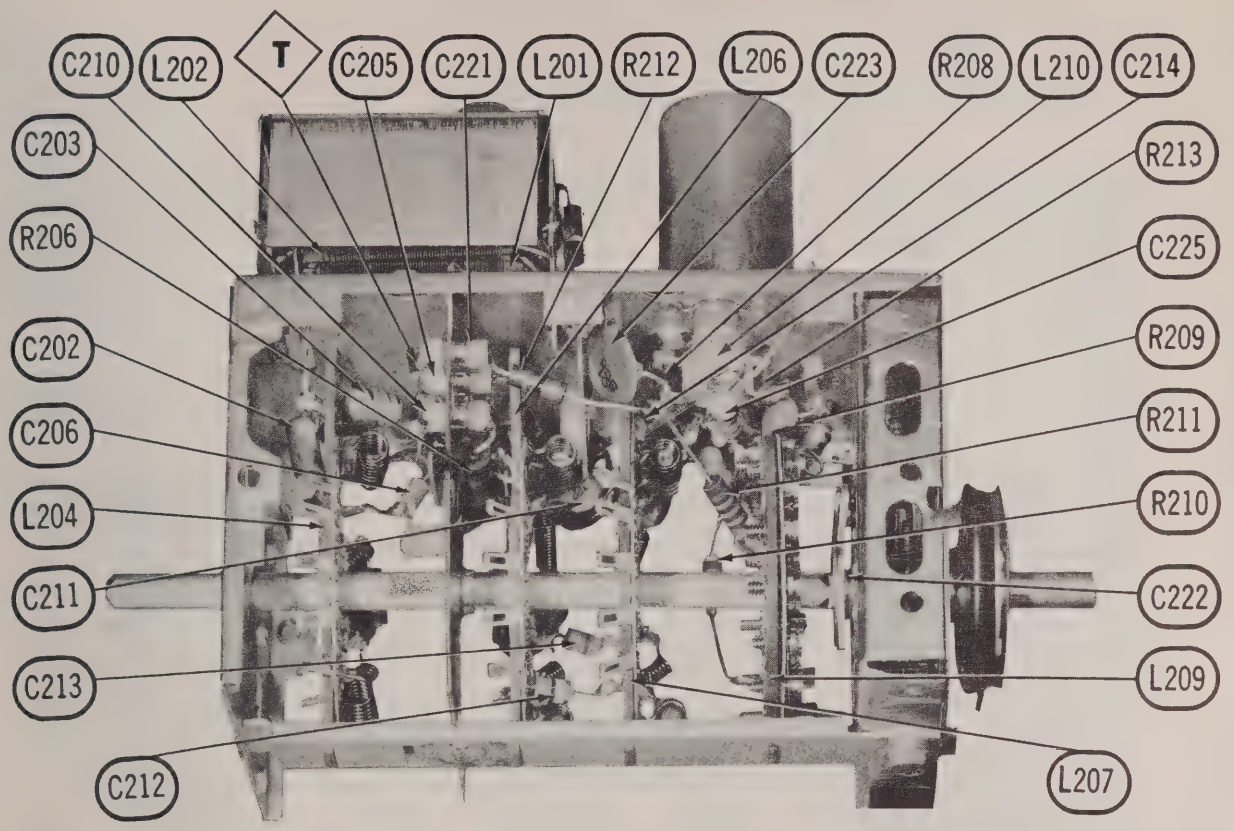
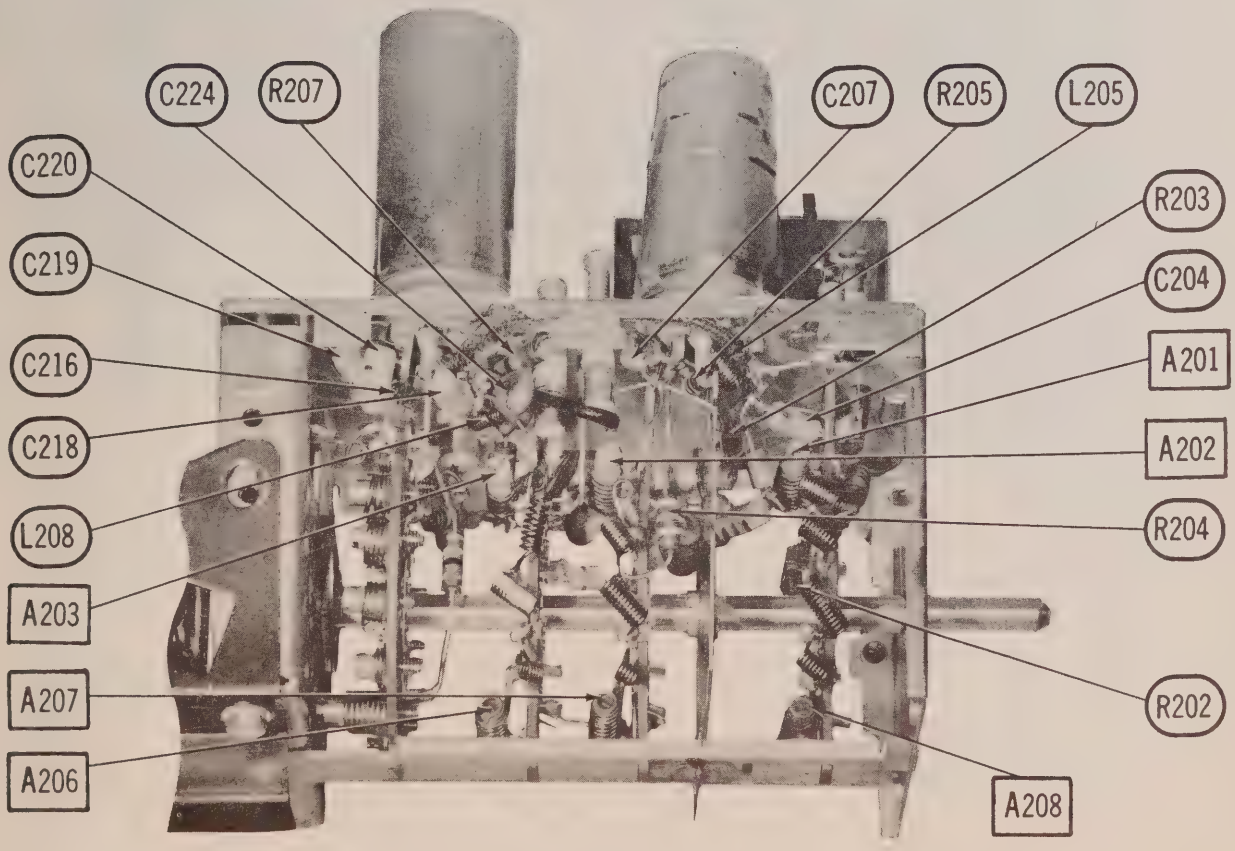


RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BC8	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6X8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	39		62-039409011	SI 39	D6-390	LT6Q39	UC-5439	5GA-Q39	
C202	5		30-1224-78						± .25mmf
C203	5		30-1224-78	SI 5	D6-050	LT6Q5	UC-555	5GA-Q5	
C204	5		30-1224-78	SI 5	D6-050	LT6Q5	UC-555	5GA-Q5	
C205	1000		30-1245-6	EF-001	MFT-1000			503C-D1	
C206	3.3		30-1221-9	NPO-SI 3.3	TCO-3R3	CTA6V33C	ZT-5533	5TCCB-V33	
C207	150		30-1265	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C208	.5-3		31-6520-3		829-3		CT565A		
C209	1000		30-1245-6	EF-001	MFT-1000			503C-D1	
C210	1000		30-1245-6	EF-001	MFT-1000			503C-D1	
C211	150		30-1265	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C212	1		30-1221-19	NPO-SI 1.0	TCZ-1			5TCCB-V1	
C213	2.2		30-1221-6	NPO-SI 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	
C214	56		62-056409001	SI 56	D6-560	LT6Q56	UC-5456	5GA-Q56	
C215	.5-3		31-6520-3		829-3		CT565A		
C216	7.5		30-1251-19						NPO
C217	1000		30-1245-6	EF-001	MFT-1000			503C-D1	
C218	1.8		30-1224-120						N750
C219	10		30-1255-5	NPO-SI 10	TCZ-10	CTA6Q1C	ZT-541	5TCC-Q1	NPO 10%
C220	12		30-1255-6						N220 10%
C221	1000		30-1245-6	EF-001	MFT-1000			503C-D1	
C222									
C223	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C224	150		30-1265	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C225	680		62-168001011	SI 680	D6-681	LT6T68	UC-5368	5GA-T68	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R201	150K		66-4158340	
R202	1500Ω		66-2158340	
R203	10K		66-3108340	
R204	470K 5%		66-4478240	
R205	470K 5%		66-4478240	
R206	1800Ω	1	66-2184340	
R207	100K		66-4108340	

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R208	8200Ω		66-2828340	
R209	22K		66-3228340	
R210	10K		66-3108340	
R211	18K		66-3188340	
R212	1000Ω		66-2108340	
R213	12K		66-3128340	

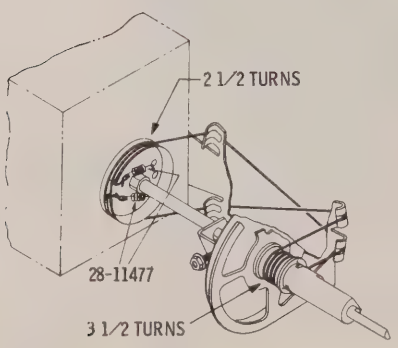
COILS (RF-IF)

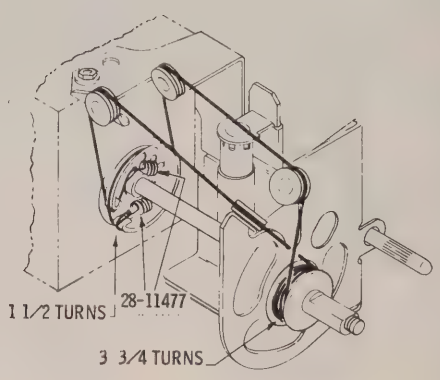
ITEM No.	USE	PHILCO PART No.	NOTES
L201	Ant. Coil	32-4527	
L202	Ant. Coil	32-4527	
L203	IF Trap	32-4719	
L204	Ant. Coils	328-0081	Channel 2-13, Includes wafer assy.
L205	Neut. Coil	32-4623-95	
L206	RF Coils	328-0083	Channel 2-13, Includes wafer assy.

ITEM No.	USE	PHILCO PART No.	NOTES
L207	Mixer Grid Coils	328-0082	Channel 2-13, Includes wafer assy.
L208	RF Choke	32-4652-32	
L209	Osc. Coils	328-0084	Channel 2-13, Includes wafer assy.
L210	Mixer Plate Coil	32-4629-4	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M201	Antenna Network	76-11115	Includes L201, L202, L203, C201





DRIVE CORD STRINGING

CHASSIS TOP VIEW

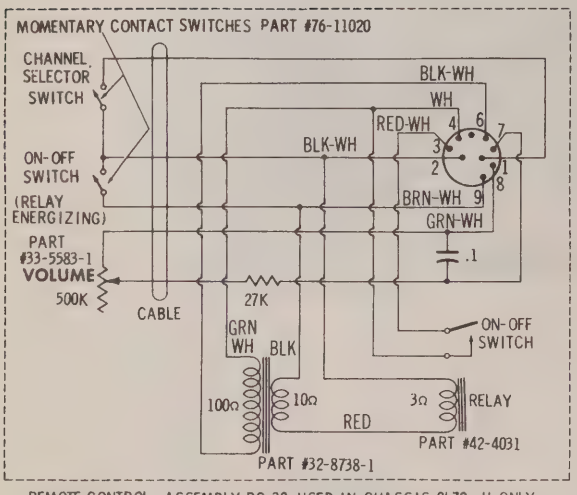
PHILCO MODELS F4216, L, F4623, F4626, L, M, F4627, L, F6624T, TL, UF4216, L, UF4623, UF4626, L, M, UF4627, L, UF6624T, TL (Ch. 8L71, U, 8L72, U, 8L73, U)

FOLDER 2

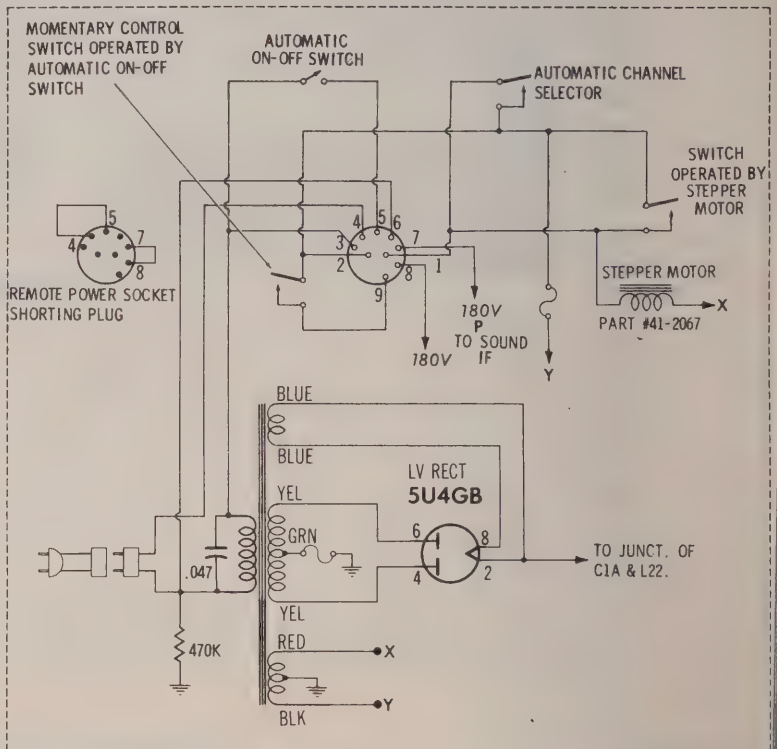
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	475K	47Ω	0Ω	.1Ω	†3000Ω	†3000Ω	0Ω		
V2	6DE6	475K	68Ω	0Ω	.1Ω	†2600Ω	†2600Ω	0Ω		
V3	6AM8	220Ω	.1Ω	†3300Ω	.1Ω	0Ω	†3300Ω	.1Ω	3900Ω	0Ω
V4	6U8	†26K	1meg	†6700Ω	0Ω	.1Ω	†8600Ω	150Ω	4000Ω	3meg
V5	6AQ5	1.3meg	•800Ω	0Ω	.1Ω	†3300Ω	†0Ω	1.3meg		
V6	6BY8	47K	0Ω	175K	.1Ω	0Ω	†58K	†58K	†56K	330Ω
V7	6AL5	54K	27K	0Ω	1.4Ω	0Ω	0Ω	27K		
V8	6AV6	10meg	0Ω	.1Ω	0Ω	3meg	470K	†220K		
V9	6AQ5	470K	680Ω	.1Ω	0Ω	†1500Ω	†1000Ω	470K		
V10	12BR7	†30K	1.2meg	0Ω	0Ω	0Ω	0Ω	1meg	390K	.1Ω
V11	12AU7A	‡280K	1meg	560Ω	.1Ω	.1Ω	‡280K	•2.8meg	560Ω	0Ω
V12	6CM6	†0Ω	0Ω	1.8meg	0Ω	.1Ω	1.8meg	390Ω	NC	‡460Ω
V13	12AU7A	†20K	6meg	1200Ω	.1Ω	.1Ω	†46K	•110K	1200Ω	0Ω
V14	6DQ6GTA	TP	0Ω	TP	•†9500Ω	1.5meg	NC	.1Ω	0Ω	TOP CAP ‡19Ω
V15	6AX4GT	NC	NC	¶100K	NC	†1.8Ω	NC	0Ω	.1Ω	
V16	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡550Ω
V17	5U4GB	NC	¶20K	NC	20Ω	NC	22Ω	NC	¶20K	
V18	21BSP4	0Ω	1meg	Pin 10 ‡3.5meg	Pin 11 •190K	Pin 12 .1Ω				
V201	6BC8	†1800Ω	230K	INF	0Ω	.1Ω	INF	3meg	0Ω	0Ω
V202	6X8	0Ω	22K	†21K	0Ω	.1Ω	0Ω	100K	†11K	†3000Ω
ITEM	TYPE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING MAY VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 275V SOURCE.
‡ MEASURED FROM PIN 3 OF V15.
NC NO CONNECTION.
TP TIE POINT.



REMOTE CONTROL ASSEMBLY RC-30, USED IN CHASSIS 8L72, U ONLY



LV POWER SUPPLY & REMOTE CONTROL CIRCUITRY USED IN CHASSIS 8L72, U ONLY

SET 403 FOLDER 3

RCA VICTOR MODELS 21DF8635, U, 21DF8636, U, 21DF8646, U, 21DF8649, U, 21VF8695, U, 21VF8696, U, 21VF8697, U (Ch. KCS108K, L, CTP5B, C)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs from the side.

2. Remove 6 wood screws holding the rear cover. Remove the rear cover.

3. Remove the picture tube socket, yoke plug, amplifier plugs, speaker leads, tuner plugs and pilot light plugs.

4. Remove 2 metal screws holding the contrast control bracket.

5. Remove 2 metal screws holding control panel to recessed case.

6. Remove 1 wood screw from rear tuner brace.

7. Remove 3 hex nuts holding the tuner bracket. Remove the channel indicator belt and the tuner.

8. Remove 2 hex nuts holding the top of the chassis.

9. Remove 2 chassis bolts from the bottom.

10. Partially remove the chassis. Remove the HV lead. Remove the chassis.

MODEL 21DF8636 (CH. KCS108K &CTP5C)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21VF8695, 21VF8696, 21VF8697	KCS108K & CTP5B
		21DF8635, 21DF8636, 21DF8637, 21DF8646, 21DF8649	KCS108K & CTP5C
		21VF8695U, 21VF8696U, 21VF8697U	KCS108L & CTP5B
		21DF8635U, 21DF8636U, 21DF8637U, 21DF8646U, 21DF8649U	KCS108L & CTP5C

MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.
TYPE SET	Television Receiver With Audio Amplifier
TUBES	TV - Eighteen Amp. - 5 Tubes, 1 Transistor
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 265 Watts, 2.44 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 12 adjustment is located at 2 o'clock, proceed in a counterclockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Pry off the metal trim strips at the top and bottom edges of the safety glass. Slide the retainer bars to the side and remove the safety glass.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
No provision is made to vary the focus on this receiver.

C. Sync Stab.
Adjust picture to lock in with hold controls. If picture jitters, tears, etc., adjust Sync Stab. until stable. Readjust hold controls and check operation on all channels in the area.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Adjust Horizontal Hold until picture synchronizes horizontally. If satisfactory results cannot be obtained by the above adjustment see "Horizontal Sweep Circuit Adjustments".

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the Ratio Detector secondary (A7) located on bottom of chassis.

FUSES

One fuse is used for Horizontal Sweep Circuit protection and 3 fuse wires in the filament circuit.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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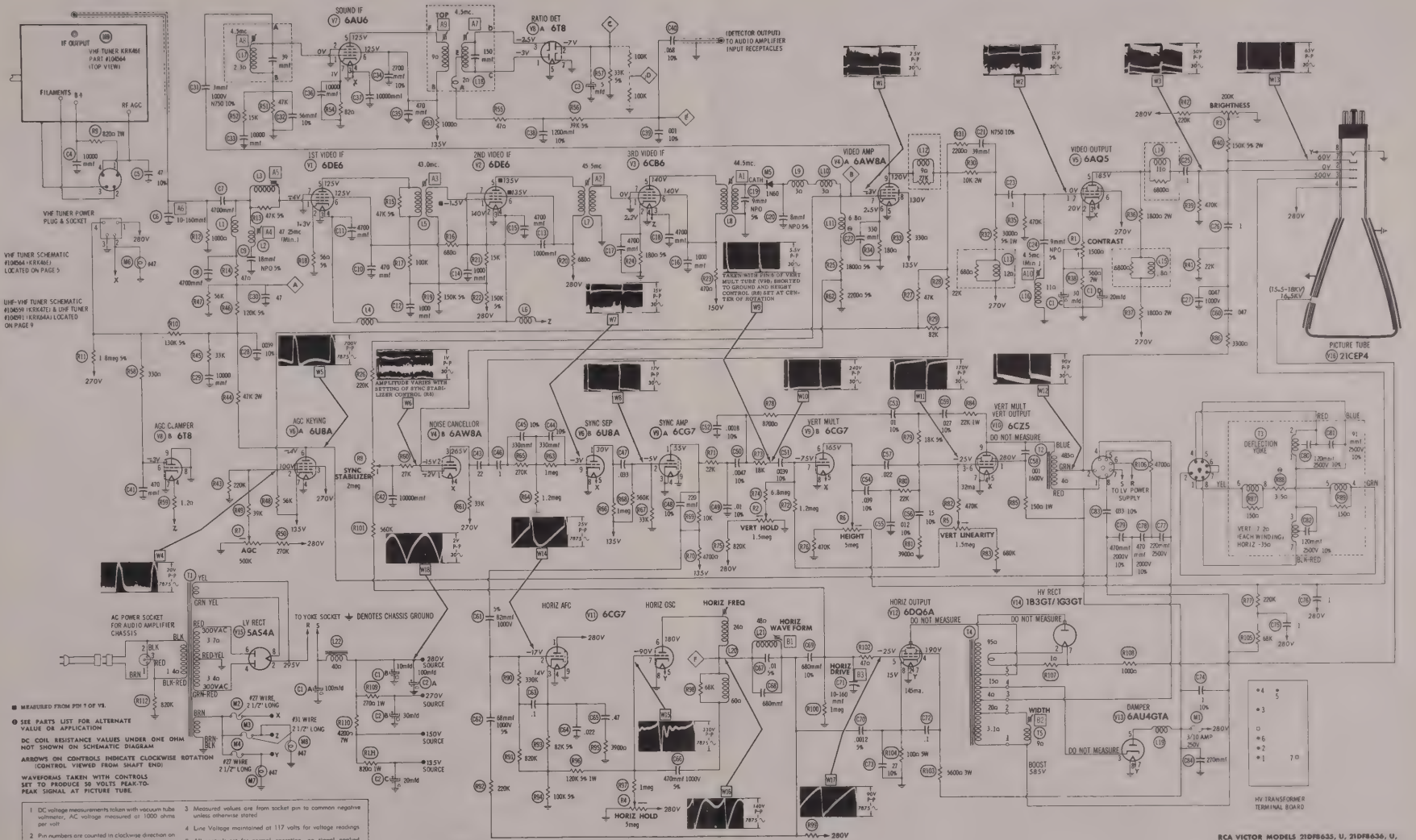
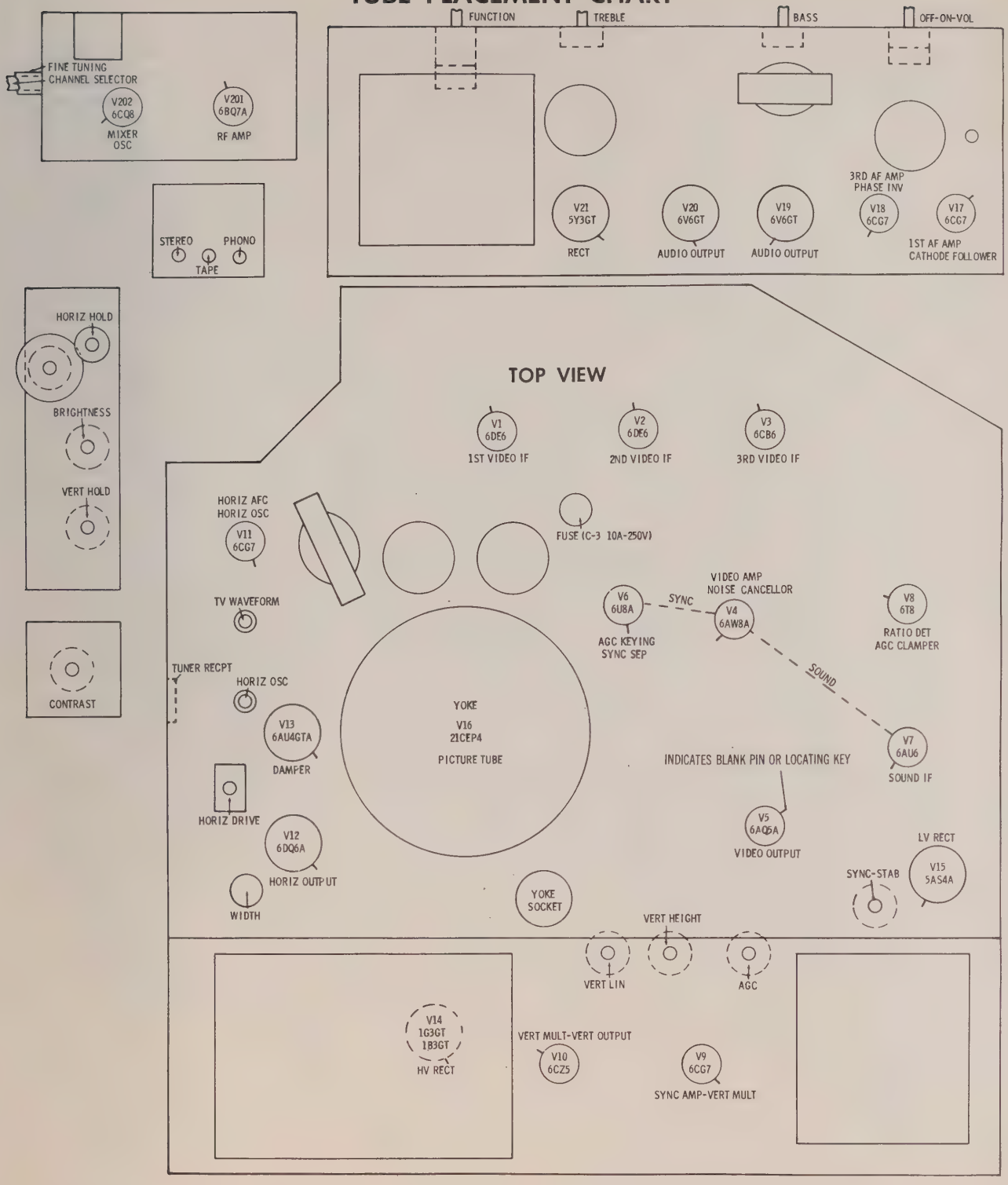

SOUND IF V7 6AU6
RATIO DET V6 A 6T8
(DETECTOR OUTPUT) TO AUDIO AMPLIFIER INPUT RECEPTACLES
IF OUTPUT
VHF TUNER KRK46 PART #10064 (TOP VIEW)
FILAMENTS
RF AGC
1ST VIDEO IF V1 6DE6
2ND VIDEO IF V2 6DE6
3RD VIDEO IF V3 6CB6
VIDEO AMP V4 A 6AW8A
VIDEO OUTPUT V5 6AQ5
BRIGHTNESS
CONTRAST
PICTURE TUBE V16 21CEP4
VHF TUNER POWER PLUG & SOCKET
VHF TUNER SCHEMATIC #10069 (KRK47) & UHF TUNER #10059 (KRK46A) LOCATED ON PAGE 5
UHF-VHF TUNER SCHEMATIC #10059 (KRK47) & UHF TUNER #10059 (KRK46A) LOCATED ON PAGE 9
AGC CLAMPER V8 B 6T8
AGC KEYING V8 A 6U8A
NOISE CANCELLOR V4 B 6AW8A
SYNC SEP V6 B 6U8A
SYNC AMP V9 A 6CG7
VERT MULT V5 B 6CG7
VERT MULT VERT OUTPUT V10 6CZ5 DO NOT MEASURE
SYNC STABILIZER
AGC
HEIGHT
VERT HOLD
VERT LINEARITY
TO LV POWER SUPPLY
DEFLECTION YOKE
AMPLITUDE VARIES WITH SETTING OF SYNC STABILIZER CONTROL (R8)
TAKEN WITH PIN 6 OF VERT MULT TUBE (V5B) SHORTED TO GROUND AND HEIGHT CONTROL (R8) SET AT CENTER OF ROTATION
AC POWER SOCKET FOR AUDIO AMPLIFIER CHASSIS
LV RECT 5AS4A
TO YOKE SOCKET
DENOTES CHASSIS GROUND
HORIZ AFC V11 6CG7
HORIZ OSC
HORIZ FREQ
HORIZ WAVE FORM
HORIZ OUTPUT V12 6DQ6A DO NOT MEASURE
HV RECT V14 1B3GT/1G3GT
DAMPER V13 6AU4GTA
WIDTH
BOOST 585V
HORIZ DRIVE
HORIZ HOLD
HV TRANSFORMER TERMINAL BOARD
■ MEASURED FROM PIN 7 OF V8.
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
RCA VICTOR MODELS 21DF8635, U, 21DF8636, U, 21DF8646, U, 21DF8649, U, 21VF8695, U, 21VF8696, U, 21VF8697, U (Ch. KCS108K, L, CTP58, C)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

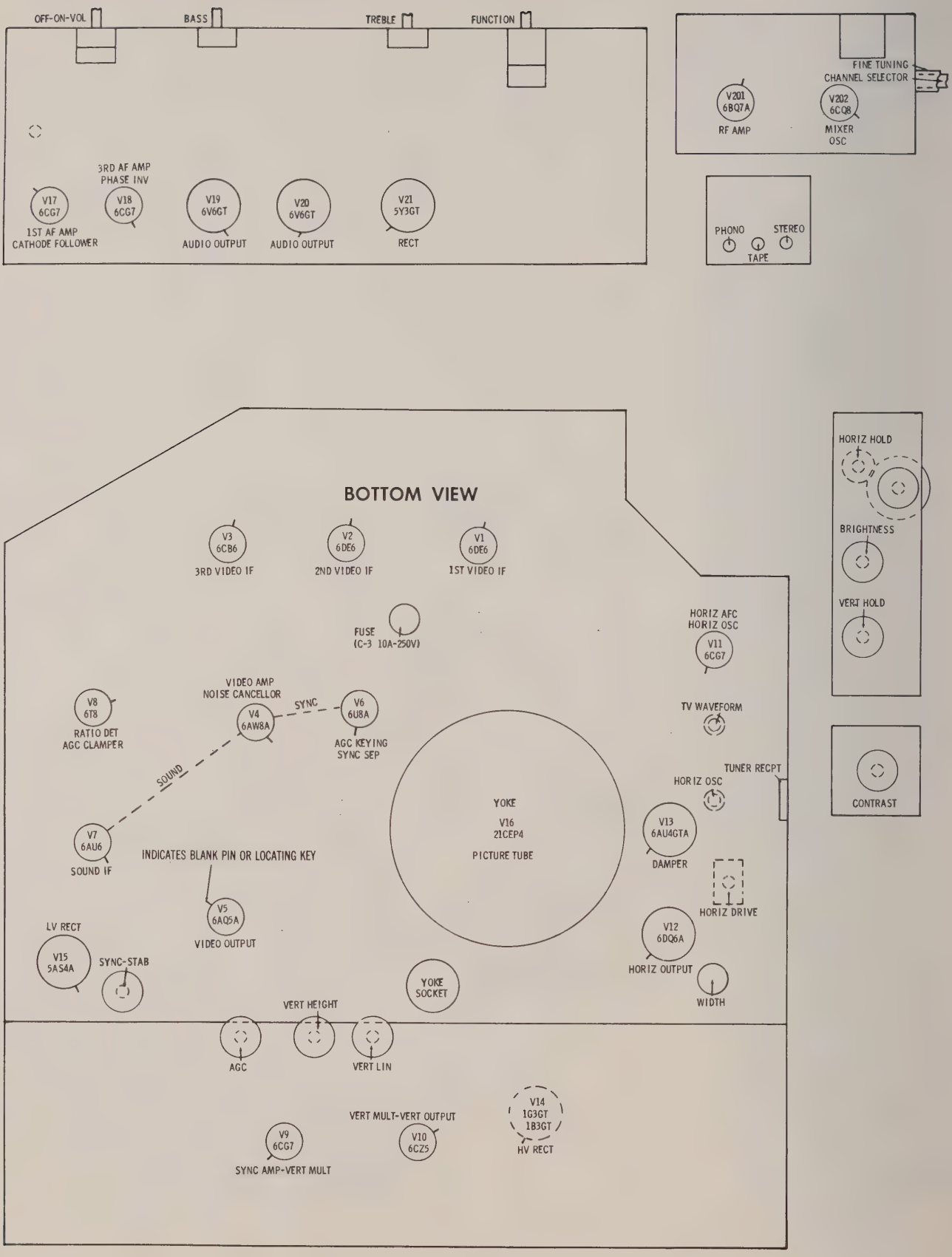
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (M2, M3, M4), V15

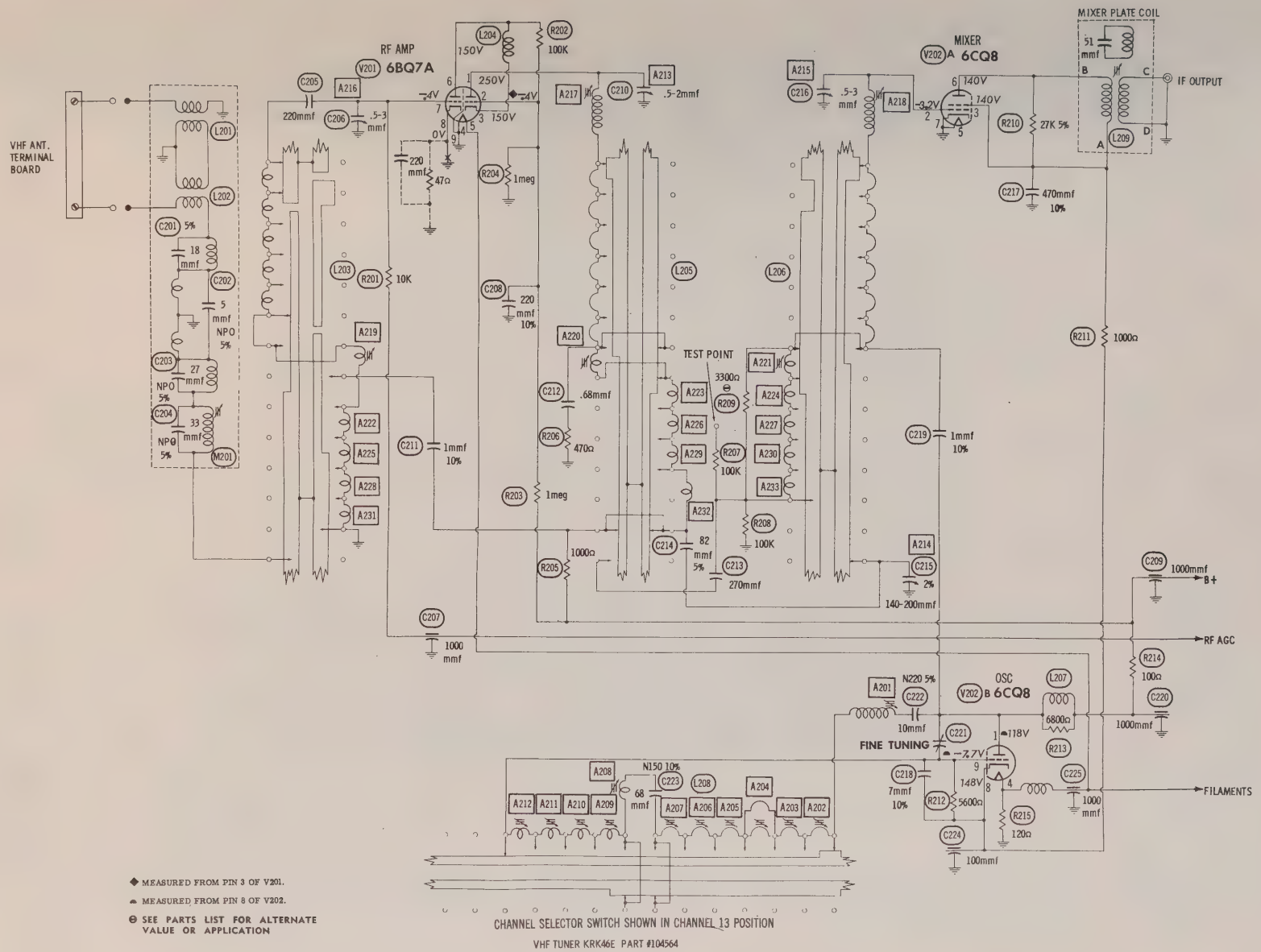
SWEEP FAILURE
No raster, has sound Fuse (M1), V11, V12, V13, V14, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M5), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V16
Has pic, no sound V7, V8, V17, X1, V18, V19, V20, V21
Overloaded picture V6

SYNC FAILURE
No vert. sync V6, V9
No horiz. sync V6, V9, V11
No vert. or horiz. sync V6, V9



TUBE PLACEMENT CHART



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER #104564 (KRK46E)

RCA VICTOR MODELS 21DF8635, U, 21DF8636, U,
21DF8646, U, 21DF8649, U, 21VF8695, U, 21VF8696, U,
21VF8697, U (Ch. KCS10BK, L, CTP5B, C)

TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT FOR TUNERS KRK46E & KRK47E

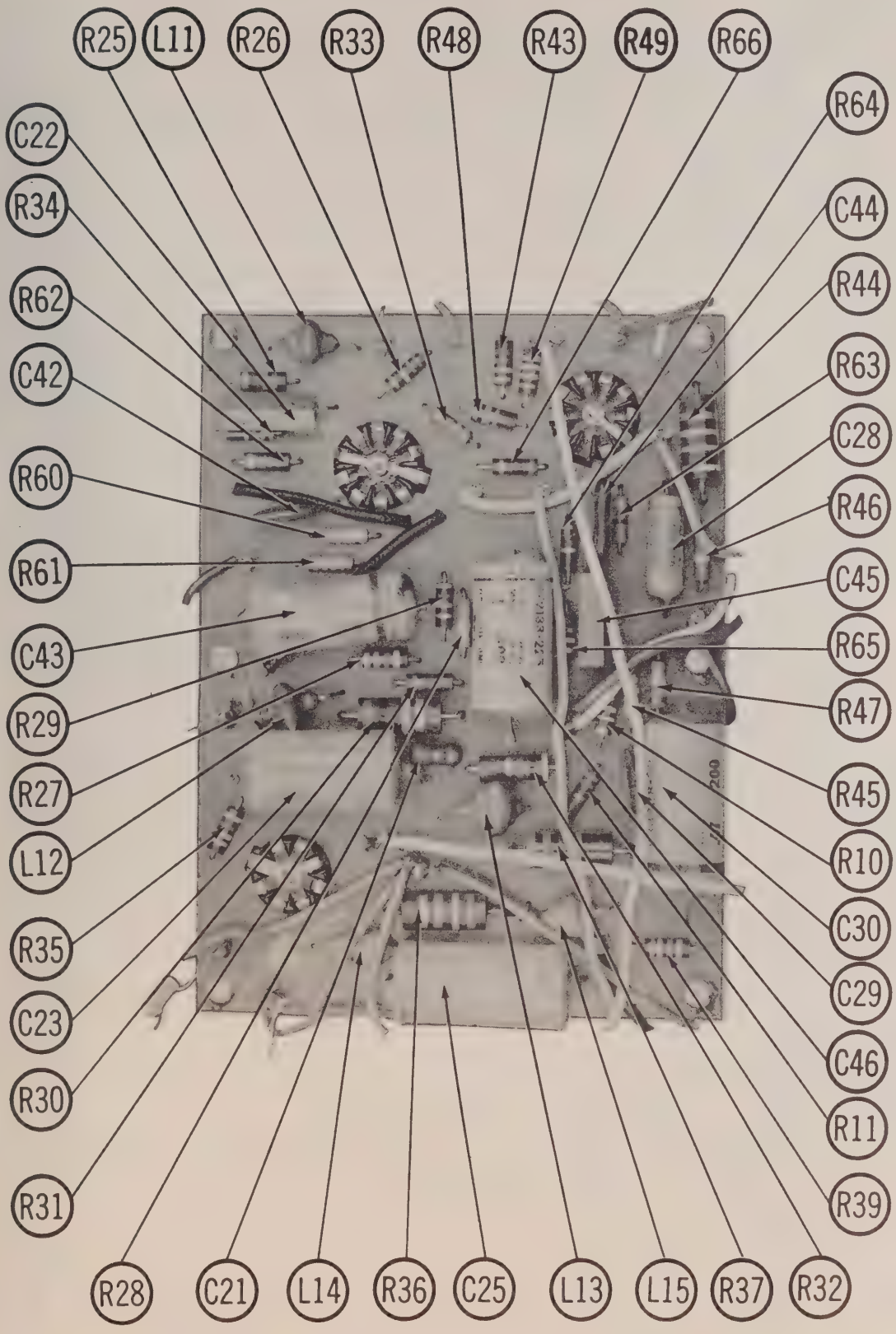
Connect the negative lead of a 3 volt bias supply to point Ⓣ. Positive to chassis.
Unplug IF output cable from the tuner and connect a 39Ω resistor across the socket.
Unplug UHF tuner (if used) and plug adaptor (shown in Fig. 203) in its place.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	Not used	257MC	13	Vert. Amp. thru diode probe to point Ⓤ. Low side to chassis.	A201	Adjust for zero beat on scope.
2.	"	"	"	251MC	12	"	A202	"
3.	"	"	"	245MC	11	"	A203	"
4.	"	"	"	239MC	10	"	A204	"
5.	"	"	"	233MC	9	"	A205	"
6.	"	"	"	227MC	8	"	A206	"
7.	"	"	"	221MC	7	"	A207	"
8.	"	"	"	129MC	6	"	A208	"
9.	"	"	"	123MC	5	"	A209	"
10.	"	"	"	113MC	4	"	A210	"
11.	"	"	"	107MC	3	"	A211	"
12.	"	"	"	101MC	2	"	A212	"
13.	"	"	183MC	181.25MC 185.75MC	8	"	A213, A214, A215, A216	Adjust for maximum gain and symmetry of response similar to Fig. 202. with markers as shown. Adjust A213 for marker position, A214 for proper bandwidth, A215 for proper tilt and A216 for maximum gain.
14.	"	"	213MC	211.25MC 215.75MC	13	"	A217, A218	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A217 for proper marker positions, A218 for proper tilt and retouch A214 for proper bandwidth.
15.	Repeat steps 13 and 14 for proper tracking and response on all channels from 13 to 7. Repeat step 1. Turn off generators and measure oscillator injection voltage at point Ⓤ with VTVM. The reading obtained should be between -2.5 to -5.5 volts for KRK46E, and -1.5 to -4.75 for KRK47E. If outside these limits, replace V202 and repeat steps 1 thru 14.							
16.	Repeat step 8.							
17.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	85MC	83.25MC 87.75MC	6	Vert. Amp. thru diode probe to point Ⓤ. Low side to chassis.	A219, A220, A221	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A219 for maximum gain, A220 for proper marker positions and A221 for proper tilt.
18.	"	"	79MC	77.25MC 81.75MC	5	"	A222, A223, A224	If necessary, adjust appropriate coil for response similar to Fig. 202.
19.	"	"	69MC	67.25MC 71.75MC	4	"	A225, A226, A227	"
20.	"	"	63MC	61.25MC 65.75MC	3	"	A228, A229, A230	"
21.	"	"	57MC	55.25MC 59.75MC	2	"	A231, A232, A233	"

UHF ALIGNMENT FOR TUNER KRK47E

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 203	High side thru adaptor (Fig. 203) to point Ⓥ. Low side to chassis.	44MC	41.25MC 45.75MC	UHF	Connect 330mmf capacitor in series with a 180Ω resistor from plate of Mixer (V202) to chassis with resistor next to chassis. High side of scope thru diode probe to junction of capacitor and resistor Low side to chassis.	A234, A235	Use only enough Sweep Generator output to provide a usable pattern on scope. Adjust A234 and A235 for response similar to Fig. 204.
23.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead. Reconnect cable from UHF tuner to VHF tuner. Connect separate marker generator loosely to grid of 1st. Video IF Amp. (V1).	Tune over entire UHF range.	42.5MC 45.0MC 45.75MC	Tune over entire UHF range	Across video detector load.		Use only enough Sweep Generator output to provide a usable pattern on scope. Check tracking across UHF band and if necessary, retouch A234 and A235 for response similar to Fig. 205.

(continued) PAGE 23



VIDEO SYNC & AGC PRINTED BOARD

SET 403 FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Disable the horizontal sweep circuits by connecting a 150Ω 10W resistor in series with the plate lead of the Horizontal Output tube (V12).
Connect the negative lead of a 12.5 volt bias supply to pin 5 (grid) of V12. Positive to chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500mmf	High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	44.5MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe to point Ⓑ. Common to chassis. (Across video det. load.)	A1	Adjust for maximum deflection. Adjust generator output to maintain 3 volts on VTVM when finally peaked.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4 & Mixer Plate Coil (Top)	Increase generator output and adjust for MINIMUM deflection.
5.	"	"	44.0MC (10MC Swp)	42.5MC 45.75MC	"	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of 6DE6 (V1). Low side to chassis.	A5, A6 & Mixer Plate Coil (Bottom)	Connect the negative lead of a 3 volt bias supply to point Ⓒ. Positive to chassis. Connect a 180Ω resistor from plate to screen (pin 5 to 6) of 6DE6 (V1). Use only enough Sweep Generator output to provide a usable pattern on scope. Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Remove 180Ω resistor.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Remove detector probe. Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2, A3	Retouch for response similar to Fig. 3, if necessary.
7.	"	High side thru pad (Fig. 4) to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point Ⓑ. Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	"	Remove pad. High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	"	41.25MC	"	Connect VTVM & Vert. Amp. of scope thru 10K to point Ⓑ. Common to chassis.	A3, A1	Retouch for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 3.
9.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Each VHF channel in turn.	42.5MC 45.0MC 45.75MC	All VHF channels	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2	SLIGHTLY retouch A1 and A2 to correct for any overall tilt that is approximately the same on all channels. Restore horizontal circuit to normal.

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point Ⓐ. Positive to chassis.
Connect two matched 100K (±1%) resistors in series from point Ⓒ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point Ⓔ. Common to point Ⓓ.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Set the Contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector probe to pin 2 (grid) of picture tube. Low side to chassis.	A10	Adjust for MINIMUM 400∿ indication on scope.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6 & 23

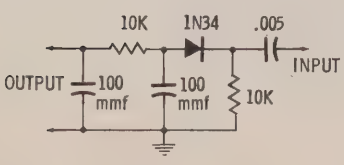


FIG. 1

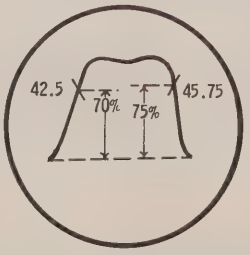


FIG. 2

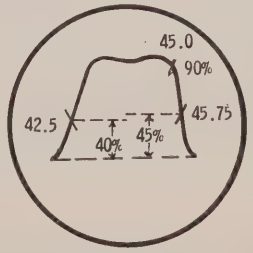


FIG. 3

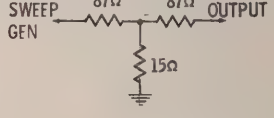
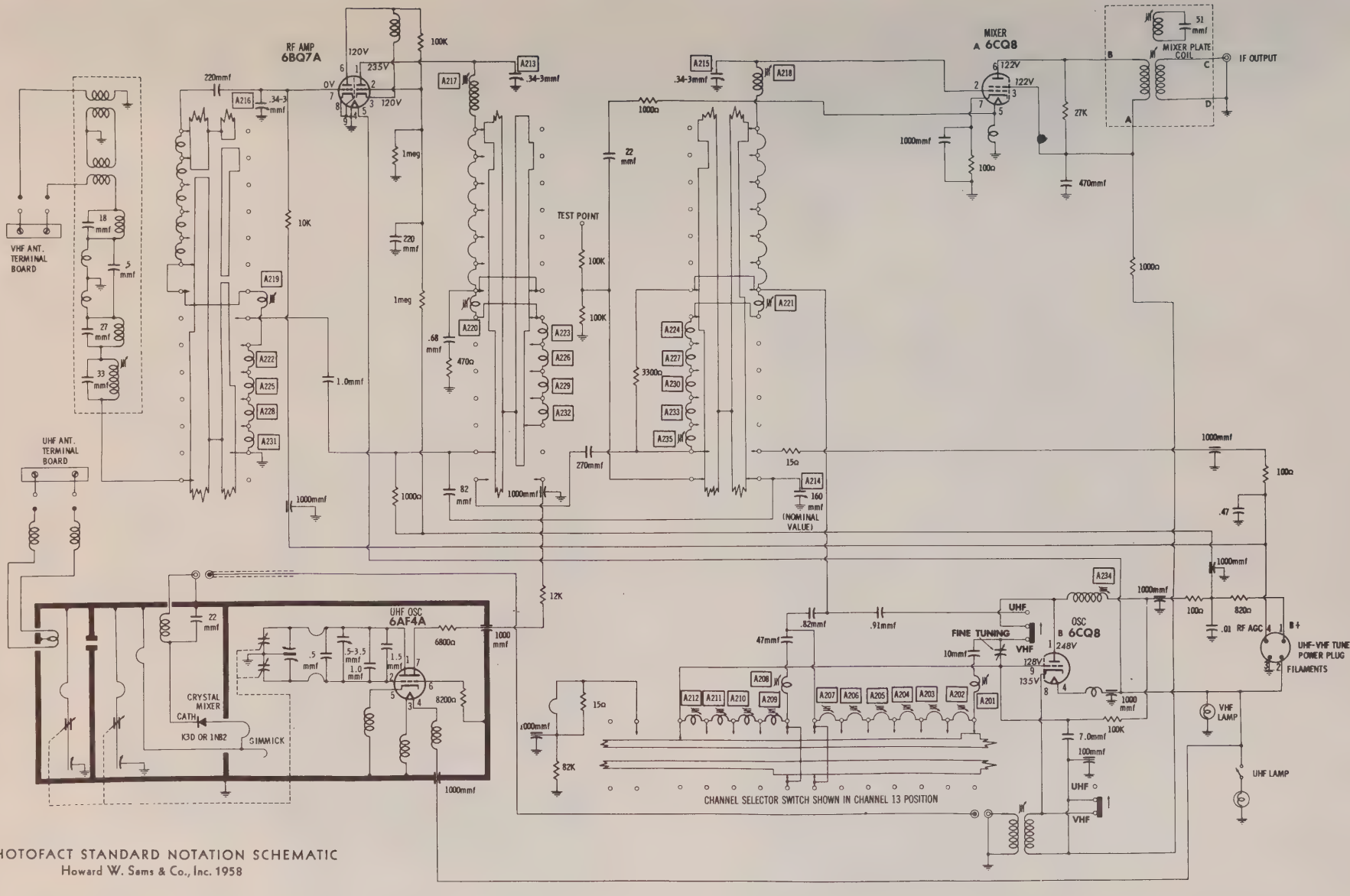


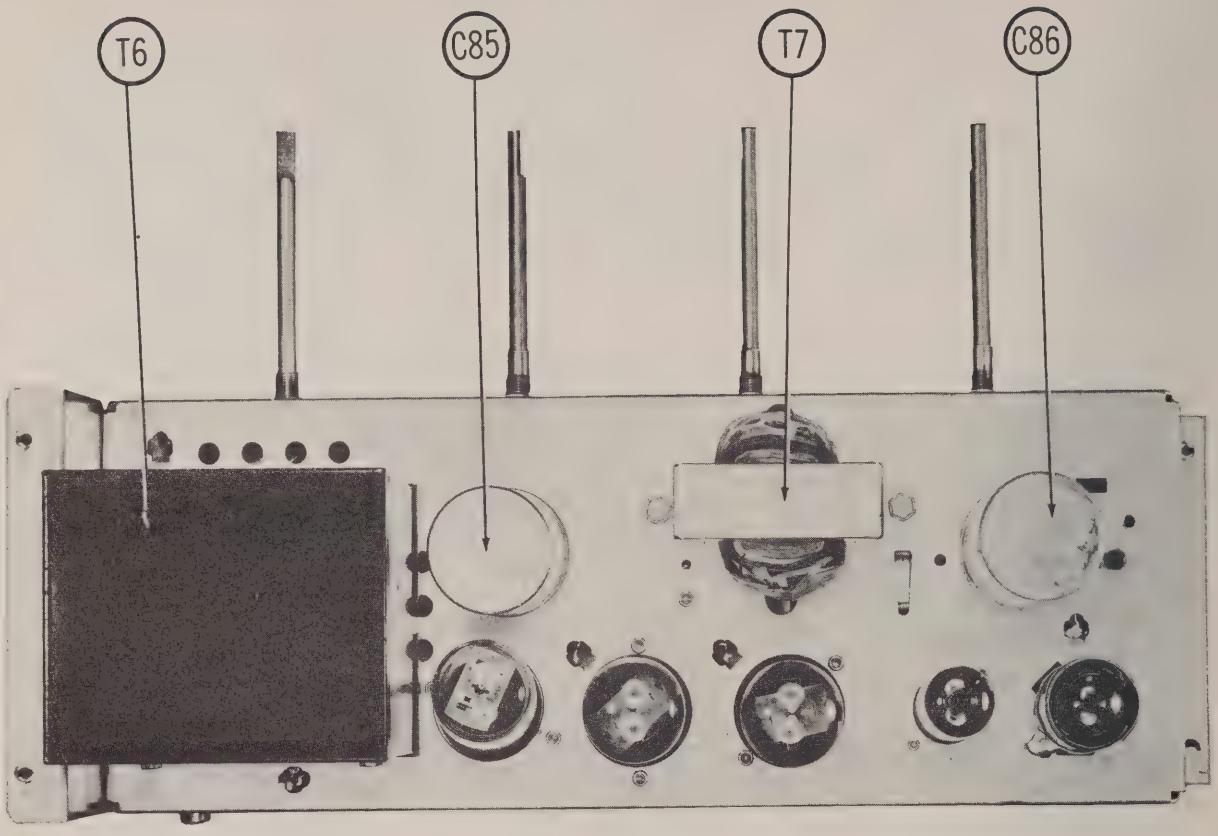
FIG. 4



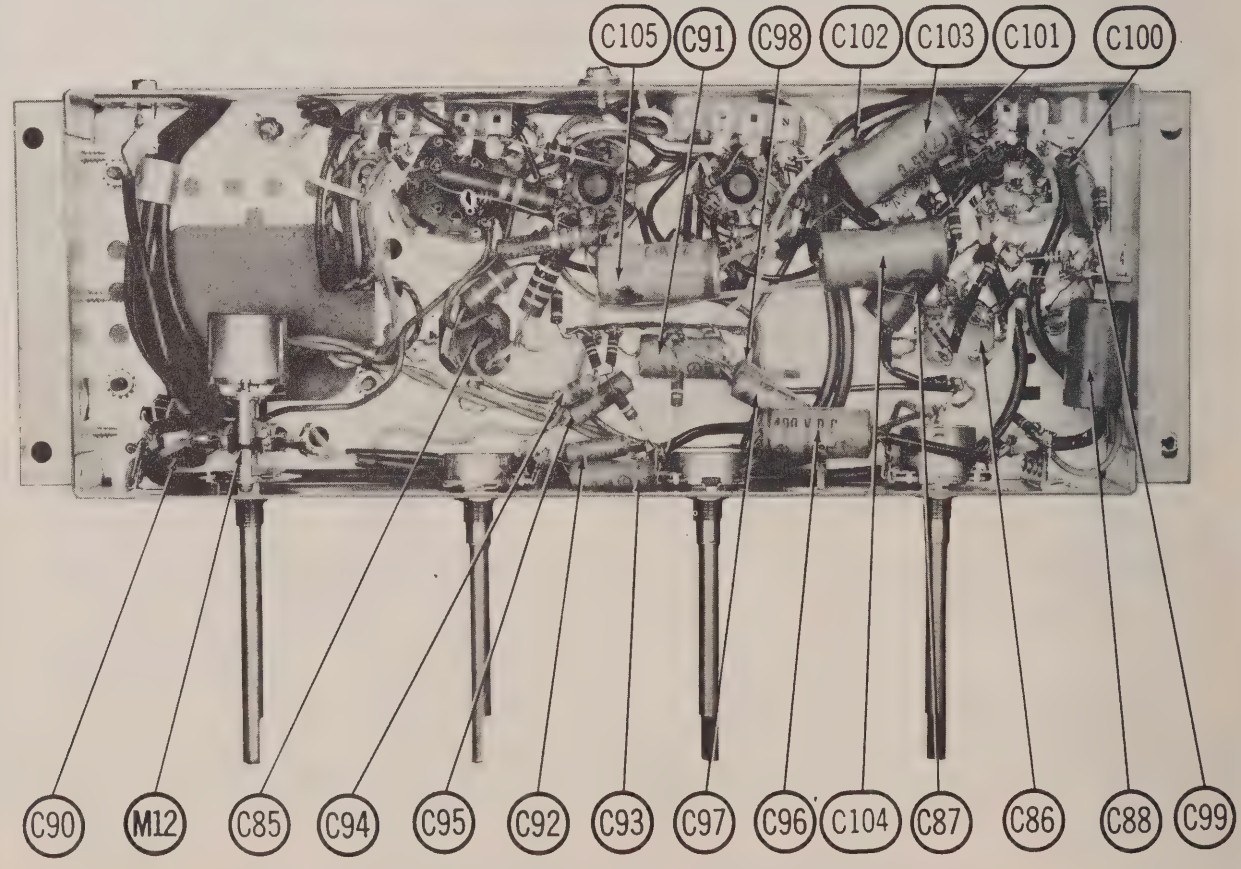
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF-VHF TUNER #104559 (KRK47E) & UHF TUNER 104591 (KRK64A)

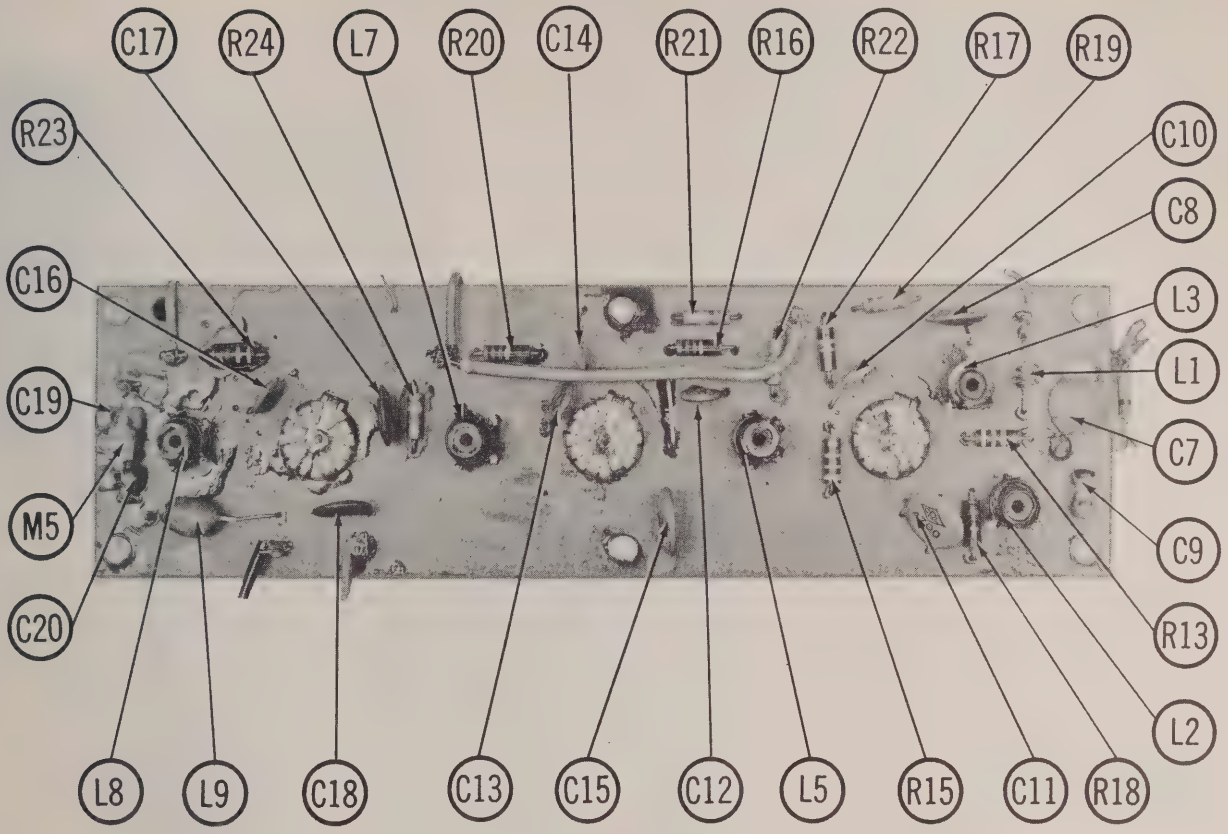
RCA VICTOR MODELS 21DF8635, U, 21DF8636, U,
21DF8646, U, 21DF8649, U, 21VF8695, U, 21VF8696, U,
21VF8697, U (Ch. KCS108K, L, CTF5B, C)



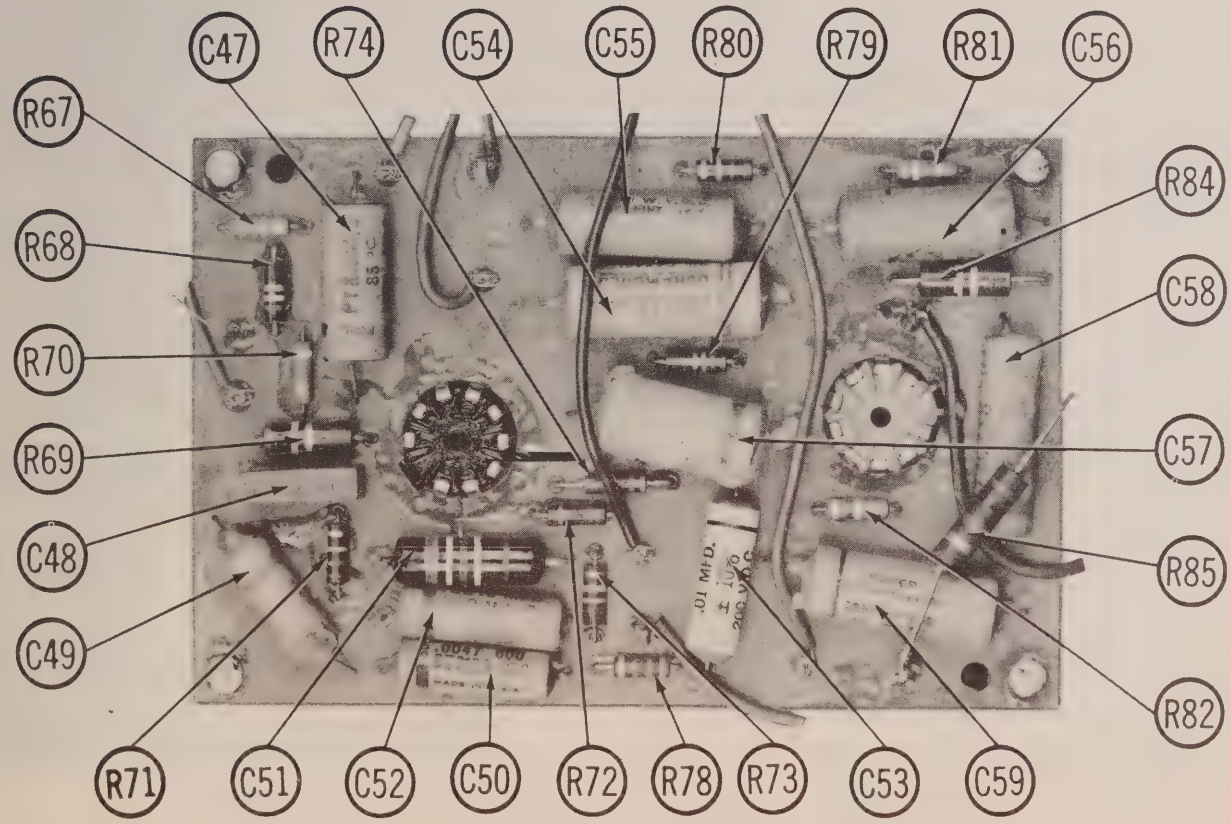
AMP CHASSIS —TOP VIEW



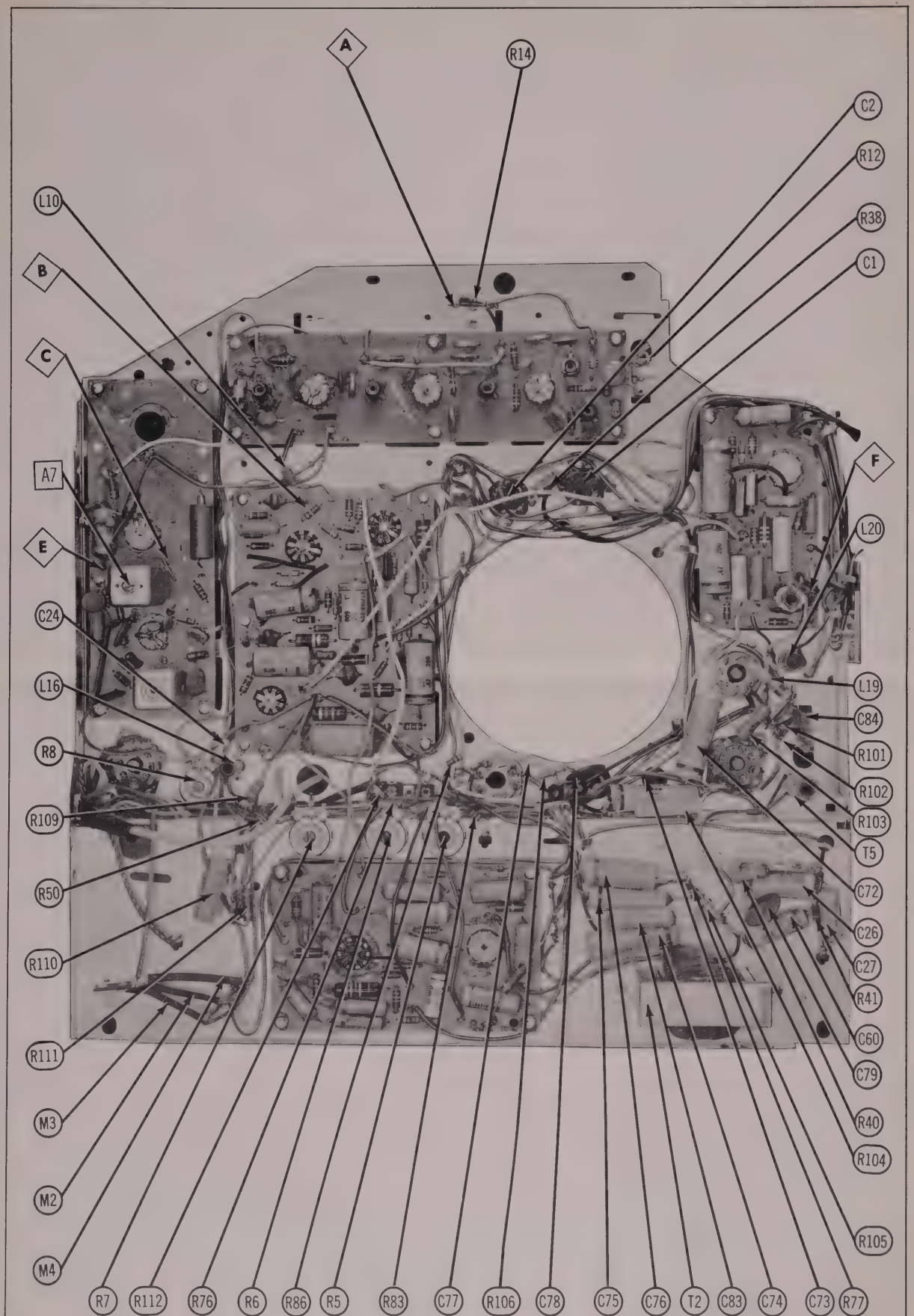
AMP CHASSIS—CAPACITOR IDENTIFICATION



VIDEO IF PRINTED BOARD



VERT & SYNC PRINTED BOARD



CHASSIS BOTTOM VIEW

KGK VICTOR MODELS 21DP8635, U, 21DP8636, U,
21DP8646, U, 21DP8649, U, 21VF8695, U, 21VF8696, U,
21VF8697, U (Ch. KCS108K, L, CTP58, C)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6DE6	
V2	2nd. Video IF Amp.	6DE6	
V3	3rd. Video IF Amp.	6CB6	
V4	Video Amp. - Noise Cancellor	6AW8A	
V5	Video Output	6AQ5A	
V6	AGC Keying-Sync Sep.	6U8A	
V7	Sound IF Amp.	6AU6	

ITEM No.	USE	TYPE	NOTES
V8	Ratio Det. -AGC Clamper	6T8	
V9	Sync Amp. -Vert. Mult.	6CG7	
V10	Vert. Mult. -Vert. Output	6CZ5	
V11	Horiz. AFC-Horiz. Osc.	6CG7	
V12	Horiz. Output	6DQ6A	
V13	Damper	6AU4GTA	
V14	HV Rect.	1G3GT/ 1B3GT	
V15	LV Rect.	5AS4A	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V16	21CEP4		21CEP4 ①	21CEP4	①"Silverama" ®

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲100	400	100858	AFHS4-57-90	D0875	FP420.7	TMT-186	Q-242	TVL-4663.5
B	■10	400					TD-30-150		
C	▲30	50							
D	20	50							
C2A	▲100	400	104301	AFH4-06-40	C0365	FP339.95		Q-025	R2552 *
B	■30	400			BR3045			MT-4530	
C	▲30	400							
C3	5	50	78943	PRS50V5	BBR5-50	TC30	TD-5-50	MT-0504	TVA-1303

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C5	.47	200	79148-A				GEM-2047		10%
C6	10-160		100849						
C7	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C8	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C9	18		103614		TCZ-18				NPO 5%
C10	470		78622	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C11	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C12	1000		77252	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C13	1000		78263	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C14	1000		77252	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C15	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C16	1000		78263	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C17	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C18	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C19	9		102647						NPO 5%
C20	8		101439						NPO 5%
C21	39		102694	N750-SI 39	TCN-39	CTA6Q39U			N750 10%
C22	330			1468-00033	DD-331	5W5T33		1FM-333	①
C23	.1	600	104311	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C24	9		102516						NPO 5%
C25	.1	600	104311	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C26	.1	400	73551	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C27	.0047	1000	73805	P1088N-0047	DD-472	CUB10D47	GEM-10247	10TM-D47	
C28	.0039	400	102218-A						10%
C29	10000		73960	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C30	.47	200	79148-A	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C31	3	1000	102415						N750 10%
C32	56		102207	NPO-SI 56	D6-560	CTA6Q56U			10%
C33	10000		73960	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C34	2700		104131						10%
C35	470		78622	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C36	10000		73960	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C37	10000		73960	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C38	1200		104384						10%
C39	.001	400	102426-A				GEM-1621		10%
C40	.068	200							10%
C41	470		77293	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C42	10000		73960	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C43	.22	200	104310	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C44	330		102656	1469-00033	MD-331	5R5T33		MS-333	10%
C45	330		102656	1469-00033	MD-331	5R5T33		MS-333	10%
C46	.1	600	104311	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C47	.033	400	104143	P488N-033		CUB6S33	GEM-4133	6TM-S33	
C48	220		104144	1469-00022	MD-221	22R5T22		MS-322	10%
C49	.01	400	102220-A				GEM-1611		10%
C50	.0047	600	102225-A				GEM-16247		10%
C51	.0039	600	73796						10%
C52	.0018	600	77727						10%
C53	.01	200	79316				GEM-1611		10%
C54	.039	400	73790						10%
C55	.012	400	79781						10%
C56	.15	200	104146						10%
C57	.022	600	104145	P688N-022		CUB6S22	GEM-6122	6TM-S22	
C58	.001	1600	73849	VBC-2	DD30-102	CUB16D1	GEM-1621	MB-D1	
C59	.027	600	75345						10%
C60	.047	400	73553	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C61	82	1000	76474		DD-820				5%
C62	68	1000	76475		DD-680				5%
C63	.1	400	73551	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C64	.022	400	103351-A	P488N-022		CUB4S22	GEM-4122	4TM-S22	
C65	.47	200	79148-A	P288N-47		CUB2S47	GEM-2022	2TM-P47	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
			REPLACEMENT DATA						
C66	470	1000	104147		MD-471				5%
C67	.01	600	73594						5%
C68	680			BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C69	680		78796	1469-00068	MD-681	1R5T68		MS-368	10%
C70	.0012	600	78995						5%
C71	10-180		100849						
C72	.1	600	73557	P488N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C73	27	400	73786				GEM-6027		10%
C74	.1	600	73557						10%
C75	.1	400	73551	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C76	.1	400	73551	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C77	220	2500	104388						
C78	470	2000	104383						10%
C79	470	2000	104383						10%
C80	120	2500	103536						10%
C81	91	2500	103525						10%
C82	120	2500	103536						10%
C83	033	400	73552						10%
C84	270		78579	1468-00047	DD-271	5W5T27		1FM-327	

① Some versions may use 1000mmf in this application (Part #103416).

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1	1500Ω	½	105784					Contrast
R2A	1.5meg	½	104089	B-742	A47-1.5meg -S	Q1-138	U155	Vert. Hold
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.	
R3A	200K	½	104088	B-46	A47-300K-S	Q1-139	U43	Brightness
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.	
R4A	5meg	½	104090	AB-87	A47-5meg-S	Q1-141	PTA56L	Horiz. Hold
B	Shaft			AE-19	TQ	Not Req.	Not Req.	
R5A	1.5meg	½	102408	BX-742		BU-138	TA156L	Vert. Lin.
B	Shaft			Not Req.		TM2	Not Req.	
R6A	5meg	½	100390			BU-141	PTA56L	Height
B	Shaft					TM8	Not Req.	
R7A	500K	½	100862			BU7-133	PTA55R	AGC
B	Shaft					TM3	Not Req.	
R8A	2meg	½	100863	BX-75	A47-2.5meg -S	BU-139	TA26L	Sync Stab.
B	Shaft			Not Req.	FKB-1/4	SK3	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R9	820Ω	1	512182	
R10	130K 5%		502413	
R11	1.5meg 5%		502518	
R12	1000Ω		502210	
R13	47K 5%		502347	
R14	47Ω		502047	
R15	47K 5%		502347	
R16	680Ω		502168	
R17	100K		502410	
R18	56K 5%		502356	
R19	150K 5%		502415	
R20	680Ω		502168	
R21	15K		502215	
R22	150K 5%		502415	
R23	470Ω		502147	
R24	1800 5%		502218	
R25	1800Ω 5%		502218	
R26	220K		502422	
R27	47K		502347	
R28	22K		502322	
R29	82K		502382	
R30	10K	2	522310	
R31	2200Ω		502222	
R32	30000 5%	1	512220	
R33	330Ω		502133	
R34	180Ω		502118	
R35	470K		502447	
R36	1800Ω	2	522218	
R37	1800Ω	2	522218	
R38	560Ω	2	522156	
R39	470K		502447	
R40	150K 5%	2	522415	
R41	22K		502322	
R42	220K		502422	
R43	220K		502422	
R44	47K	2	522347	
R45	33K		502333	
R46	120K 5%		502412	
R47	56K		502356	
R48	56K		502356	
R49	39K		502339	
R50	270K		502427	
R51	47K		502347	
R52	15K		502215	
R53	1000Ω		502210	
R54	82Ω		502082	
R55	47Ω		502047	
R56	39K		502339	
R57	33K 5%		502333	
R58	330Ω		502133	
R59	1.2Ω		72787	
R60	27K		502327	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R61	33K		502333	
R62	2200Ω 5%		502222	
R63	1meg		502510	
R64	1.2meg		502512	
R65	270K		502427	
R66	1meg		502510	
R67	33K		502333	
R68	560K		502456	
R69	10K		502410	
R70	4700Ω		502247	
R71	22K		502322	
R72	1.2meg		502512	
R73	18K		502318	
R74	6.8meg		502568	
R75	820K		502482	
R76	470K		502447	
R77	220K		502422	
R78	8200Ω		502282	
R79	18K 5%		502318	
R80	22K		502322	
R81	3900Ω		502239	
R82	470K		502447	
R83	680K		502468	
R84	22K	1	512322	
R85	150Ω	1	512115	
R86	3300Ω		502233	
R87	150Ω		502115	
R88	3.5Ω			Note 1
R89	150Ω		502115	
R90	330K		502433	
R91	820K		502482	
R92	220K		502422	
R93	82K 5%		502382	
R94	100K 5%		502410	
R95	390Ω		502339	
R96	120K 5%	1	512412	
R97	1meg		502510	
R98	68K		502368	
R99	47K	1	512347	
R100	1meg		502510	
R101	560K		502456	
R102	47Ω		502047	
R103	5800Ω	3	104180	
R104	100Ω	5	104188	
R105	68K		502368	
R106	4700Ω		502247	
R107	1Ω		104382	
R108	1000Ω		502210	
R109	270Ω	1	512127	
R110	4200Ω	7	100846	
R111	820Ω	1	512182	
R112	820K		502482	

Note 1. Temperature compensating resistor.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
				REPLACEMENT DATA						
T1	117V @1.88A	580VCT @.280A	5V @2.5A	104302						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @8.9A									

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	RCA Victor PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
		REPLACEMENT DATA							
T2	Vert. Output	104101							
T3A	Yoke-Horiz. (19MH)	104408 ①		MDF-114 ②	Y-111 ②	DY-26A ②		Y-66-2 ②	
B	(110°)-Vert. (2.6MH)								
M10	Rear Cover & Centering Device	104460							
T4	Horiz. Output	104309		HVO-173					
T5	Width Coil (1.6-1.8MH)	104088		MWC-3 ③	201R15 ③	WC-8	WC-42	WLC-8	

① Includes R87, R89, C81, C82 and C83.
② Use original rear cover and centering device.
③ Do not use tap.

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
		REPLACEMENT DATA					
L1	RF Choke	102894					
L2	47.25MC Trap	102650					
L3	1st. Video IF	102649					
L4	Fil. Choke						
L5	2nd Video IF	101588					
L6	Fil. Choke						
L7	3rd. Video IF	101586					
L8	4th. Video IF	101588					
L9	RF Choke	102639	19-1006	TV-192	6152		18 Microhenries
L10	RF Choke	102639	19-1006	TV-192	6152		18 Microhenries
L11	Shunt Peaking Coil	101287	19-3250	TV-185	6181	VP-6	450 Microhenries
L12	Series Peaking Coil	102696	19-3180 *	TV-184 *	6180 *	VP-3 *	180 Microhenries, wound on 47K resistor
L13	Shunt Peaking Coil	101289	19-3300 ▲	TV-199 ▲	6185 ▲		300 Microhenries, wound on 6800Ω resistor
L14	Series Peaking Coil	102698	19-3125 +	TV-195 +	6183 +	VP-4 +	120 Microhenries, wound on 6800Ω resistor
L15	Shunt Peaking Coil	102698	19-3125 +	TV-195 +	6183 +	VP-4 +	120 Microhenries, wound on 6800Ω resistor
L16	4.5MC Trap	102518	20-1005				
L17	Sound IF	102645					Includes Cap.
L18	Ratio Det.	102644		TV-122-A			Includes Cap.
L19	RF Choke	76640	19-1001	BC-562	4604		1.5 Microhenries, IRC Part #CLA

* Parallel with 47K resistor.
▲ Parallel with 6800 resistor.
+ Parallel with 6800Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
			REPLACEMENT DATA						
L20	84Ω *		104087						Horiz. Freq. * Tapped @ 60Ω
L21	48Ω		100300						Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
				REPLACEMENT DATA						
L22	.300A	40Ω	1.4 Hy.	77676	CS037 ①	C-2996 ①		C-3326 ①	25C44 ①	C-33X

FUSES

ITEM No.	TYPE	RATING	RCA Victor PART No. FUSE	RCA Victor PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
			REPLACEMENT DATA					
M1	C	3/10A 250V	104295	104524	332.300 (3/10A-250V)	348002	C 3/10	HC 0 to 3/10
M2	#27 Wire 2½" Length							
M3	#31 Wire 2½" Length							
M4	#27 Wire 2½" Length							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
		REPLACEMENT DATA			
M5	1N60	105517	1N80	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M6	Lamp	31480	#47
M7	Lamp	31480	#47
M8	Lamp	31480	#47
M9	Tuner	104564	VHF (KRK46E) Ch. KCS108K
	Tuner	104559	UHF-VHF (KRK47E) Ch. KCS108L
	Tuner	104591	UHF (KRK84A) Ch. KCS108L
M10	Centering Device	104460	Includes yoke rear cover
	Printed Board	105785	Sound, Less Tubes
	Printed Board	102892	Video IF, Less Tubes
	Printed Board	102586	Video, Less Tubes
	Printed Board	104312	Vert. & Sync, Less Tubes
	Printed Board	104313	Horiz., Less Tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	104252	
Mask	104247	
Knob	105819	Bass, Treble Clear with white markings
Knob	105377	Bass, Treble Clear with black markings
Knob	102581	Brightness, Vert. Hold, Horiz. Hold
Knob	104386	Contrast, Wine
Knob	104396	Contrast, Taupe
Knob	104398	Contrast, Mocha
Knob	104397	Fine Tuning, Wine
Knob	104398	Fine Tuning, Taupe
Knob	104399	Fine Tuning, Mocha
Knob	106818	Function, Clear with white markings
Knob	106817	Function, Clear with black markings
Knob	106831	Loudness, Clear with white markings
Knob	106830	Loudness, Clear with black markings
Knob	101138-B	On-Off-Volume, Wine
Knob	100621-B	On-Off-Volume, Taupe
Knob	101140-B	On-Off-Volume, Mocha
Knob	104071	UHF Tuning, Wine
Knob	104072	UHF Tuning, Taupe
Knob	104409	UHF Tuning, Mocha
Knob	105813	VHF Channel Selector, Wine
Knob	105814	VHF Channel Selector, Taupe
Knob	105815	VHF Channel Selector, Mocha
Dial	104520	UHF, Wine
Dial	104521	UHF, Gray
Dial	104584	VHF
Dial	104585	UHF-VHF
Leg	X3930	Models 21DF8635, U
Leg	X3931	Models 21DF8636, U
Leg	X3932	Models 21DF8637, U
Cabinet	X4312	Models 21DF8635, U
Cabinet	X4309	Models 21DF8636, U
Cabinet	X4310	Models 21DF8637, U
Cabinet	X4313	Models 21DF8646, U
Cabinet	X4314	Models 21DF8649, U
Cabinet	X4325	Models 21YF8695, U
Cabinet	X4326	Models 21YF8696, U
Cabinet	X4327	Models 21YF8697, U

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V17	1st. AF Amp.- Cathode Follower	6CG7	
V18	3rd. AF Amp.-Phase Inv.	6CG7	
V19	Audio Output	6V6GT	
V20	Audio Output	6V6GT	
V21	Rect.	5Y3GT	

TRANSISTORS

ITEM No	ORIG. TYPE	USE	CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
			REPLACEMENT DATA				
X1	2N109	2nd AF Amp	2N180	2N109	2N532		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
			REPLACEMENT DATA						
C85A	▲35	400	105785	AFH3-133	C1070	FP348	TMT-133	T-880	TVL-3744
B	▲35	400							
C	▲20	25							
C86A	▲30	400	105786	AFH4-75-92				Q-315	R2659 *
B	▲20	400						MTD-303	
C	▲100	100							
D	100	100							
C87	60	25	105758	PRS150V40	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C88	10	150	78145	PRS150V10	BBR10-150	TC43	TD-10-150	MT-1510	TVA-1408
C89	8	10NP	103947	AC-PRS80 V8	BBR8-90 †	TC106	TD-8-90 † TD-10-150	MT-1516 †	R2201 *

† Connect negative leads together.
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
			REPLACEMENT DATA						
C90	470		78993	1469-00047	MD-471			MS-347	10%
C91	.047	400	105340						10%
C92	.0012	400							10% ①
C93	.01	400	103220-A				GEM-1621		10%
C94	470		78198		MD-471				10%
C95	.0047	400	105230				GEM-16247		10%
C96	.1	400	105784						10%
C97	.022	200	105762						10%
C98	.047	200	105775						10%

RCA VICTOR MODELS 21DF8635, U 21DF8636, U, 21DF8646, U, 21DF8649, U, 21YF8695, U, 21YF8696, U, 21YF8697, U (Ch. KCS108K, L, CTP3B, C)

FOLDER 3

AMP PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C99	.0012	400	105763						10%
C100	.047	200	105775						10%
C101	470		75198		MD-471				10%
C102	220		77460		MD-221			5TCC-T22	10%
C103	.27	400	105322				GEM-6027		10%
C104	.27	400	105322				GEM-6027		10%
C105	.27	400	105322				GEM-6027		10%

① Some versions use .001mfd 400V in this application (Part #102426-A).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R113A	500K	½	105767	BT-160		Q18-133XX	UDT-283	Volume, Tap ⓐ100K & 200K
B	Shaft			Not Req.		Not Req.	Not Req.	
C	Switch			KR-1 or KB-1*		76-1	US-26	
D	Coupler			Not Req.		C3	Not Req.	
R114A	500K	½	105768	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Coupler			Not Req.	Not Req.	C3	Not Req.	
R115A	500K	½	105769	B-59	A47-500K-S	Q11-133	U50	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Coupler			Not Req.	Not Req.	C3	Not Req.	

* Use KR with CRL "red label" and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R116	470K		502447	
R117	2.7meg		502527	
R118	120K		502412	
R119	15K		502315	
R120	3300Ω		502233	
R121	56K		502356	
R122	8200Ω		502282	
R123	56K		502356	
R124	220K		502422	
R125	22K		502322	
R126	22K		502322	
R127	8200Ω		502282	
R128	82K 5%		502382	
R129	1000Ω 5%		502210	Note 1
R130	27K		502327	
R131	18K 5%		502318	
R132	47K	2	522347	
R133	15K	2	522315	
R134	56K		502356	
R135	180K		502418	
R136	150K 5%		502415	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R137	33K		502333	
R138	2200Ω		502222	
R139	470K		502447	
R140	82K		502382	
R141	5600Ω		502256	
R142	8200Ω		502282	
R143	56K		502356	
R144	27K		502327	
R145	2700Ω		502227	
R146	22K		502322	
R147	22K		502322	
R148	470K		502447	
R149	270Ω	2	522127	
R150	470K		502447	
R151	4700Ω		502247	
R152	1800Ω	2	522218	
R153	27Ω	1	512027	
R154	.91Ω		105948	
R155	68Ω		502068	
R156	27Ω	1	512027	

Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T6	117V ⓐ.66A	600VCT ⓐ.080A	5V ⓐ1.79A	105771						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ2.1A									

TRANSFORMER (AUDIO OUTPUT)

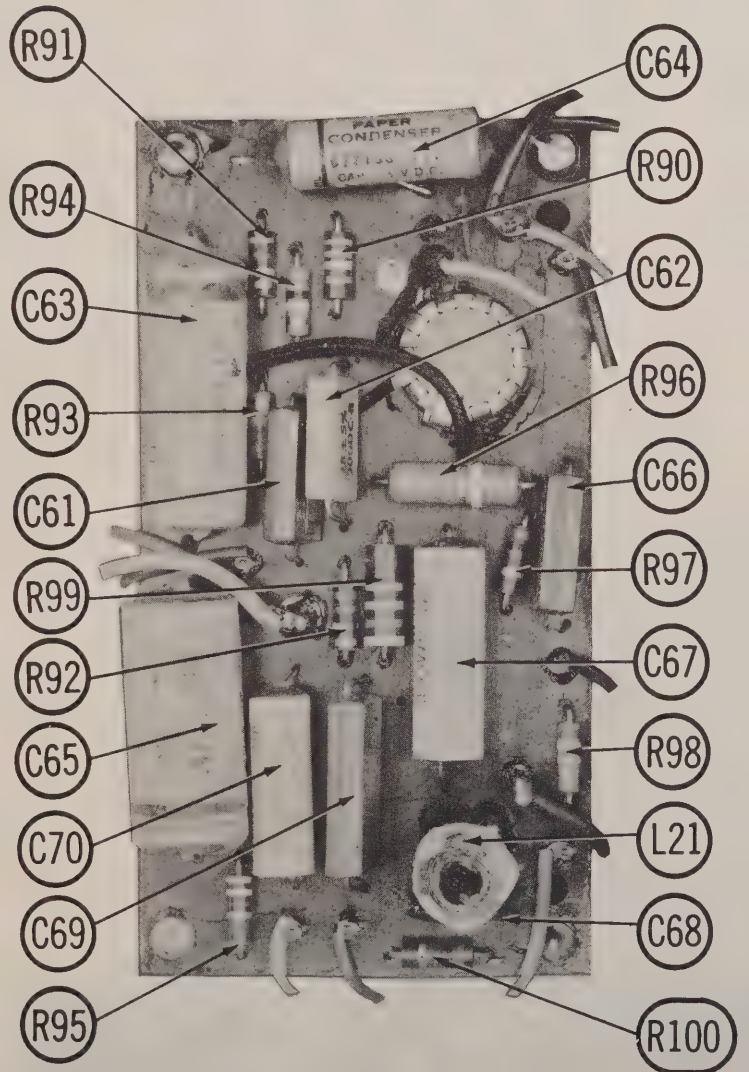
ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	7100Ω CT	8Ω Tap ⓐ 4Ω	103914	Z1404 ①				24S56 ①		① Drill new mounting hole.

SPEAKER

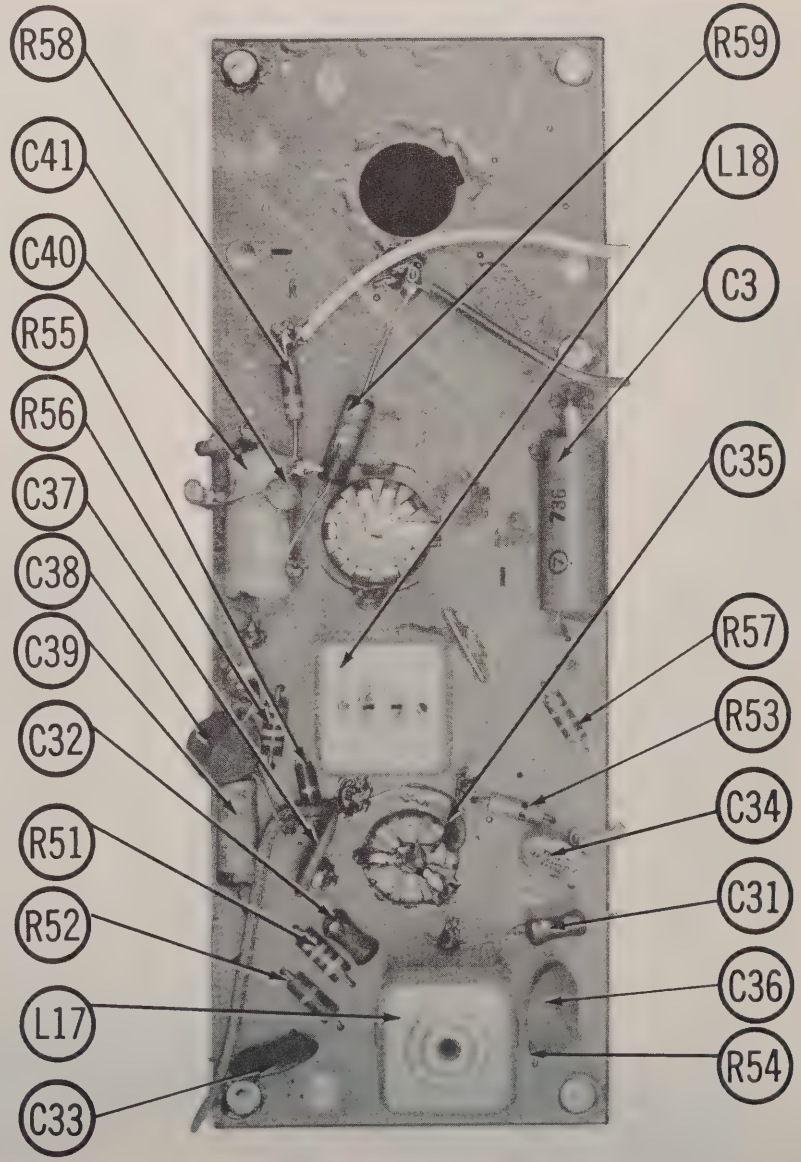
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	100897	12A10PA	① Models 21VF8695, U, 21VF8696, U, 21VF8697, U use 4 speakers in this application.
SP2	3½"	PM	6-8Ω	105395 ①	3A1Z6.4	
SP3	3½"	PM	6-8Ω	105395 ①	3A1Z6.4	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M11	Lamp	31480	#47
M12	Switch	105761	Function, Rotary Wafer Type

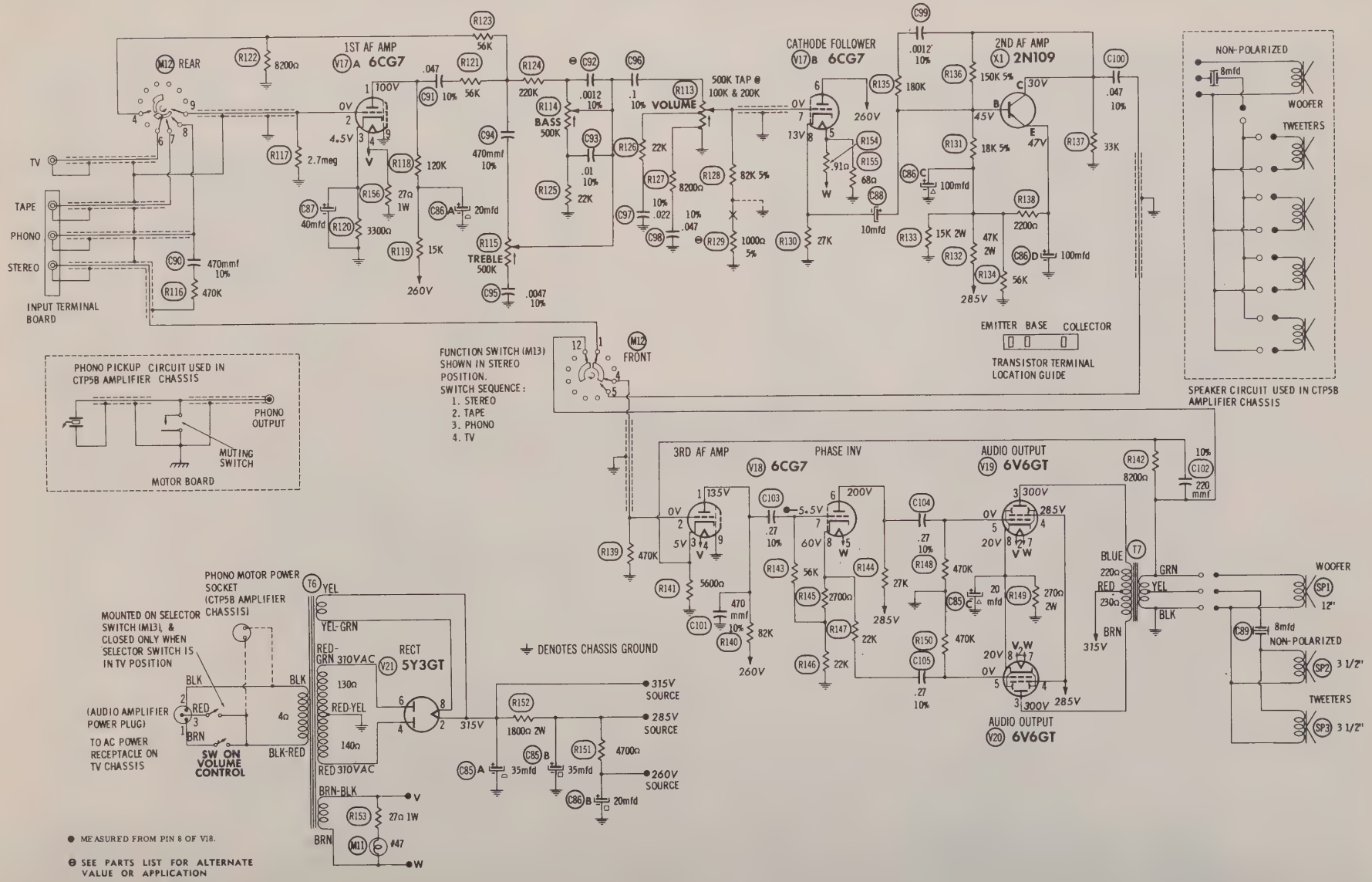


HORIZ PRINTED BOARD



SOUND PRINTED BOARD

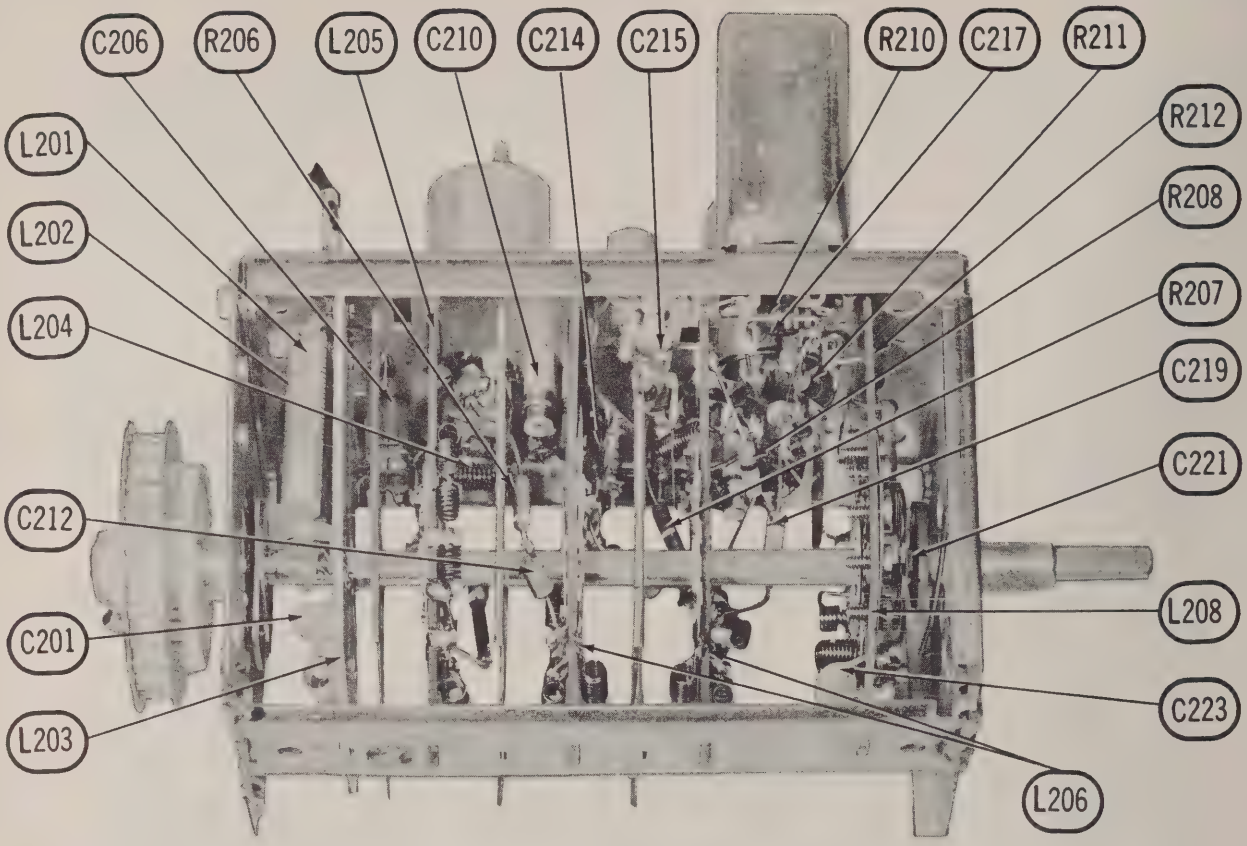
AMP CHASSIS—RESISTOR IDENTIFICATION



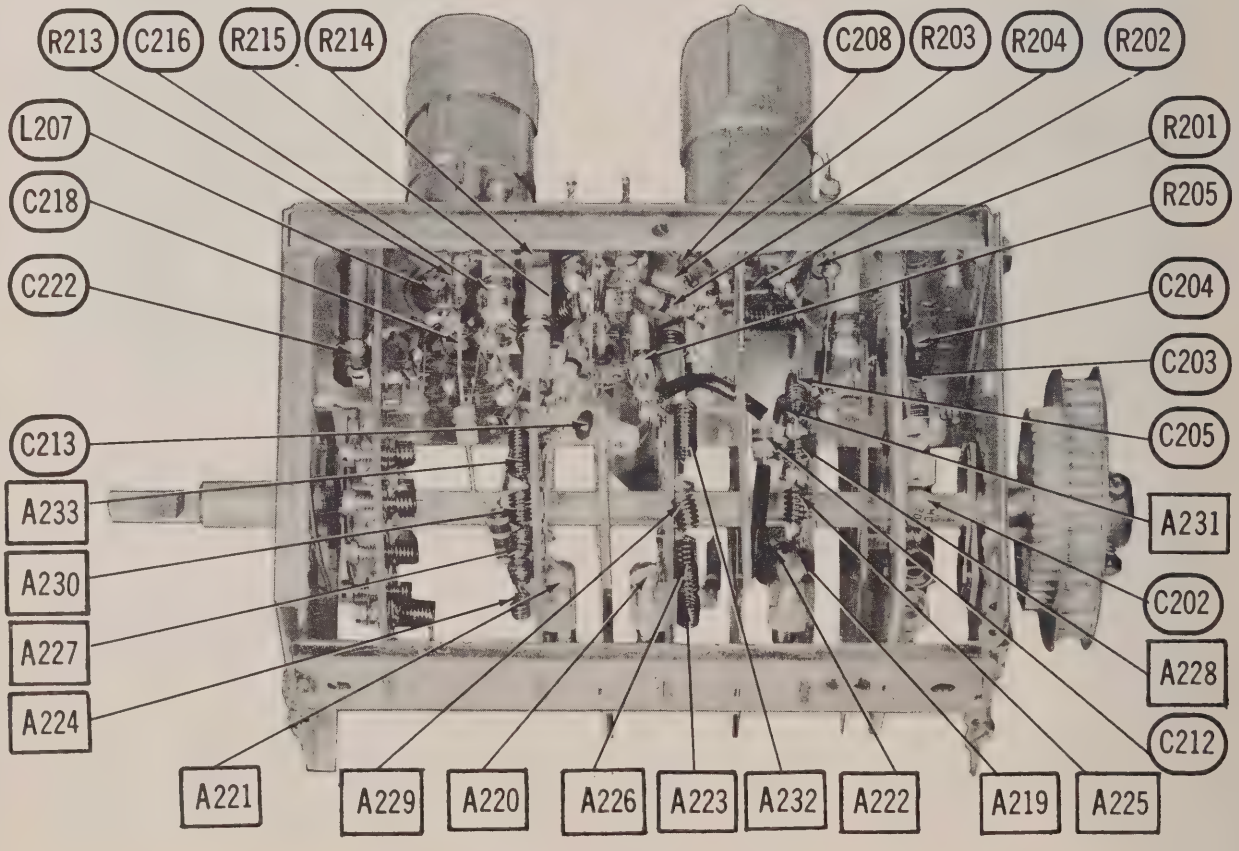
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

AMPLIFIER CHASSIS CTP5B & C

CHASSIS TOP VIEW



TUNER-LEFT SIDE



TUNER-RIGHT SIDE

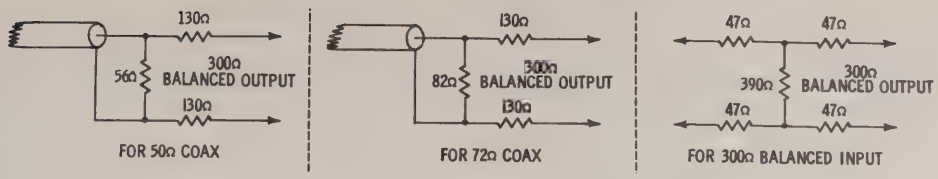


FIG. 201

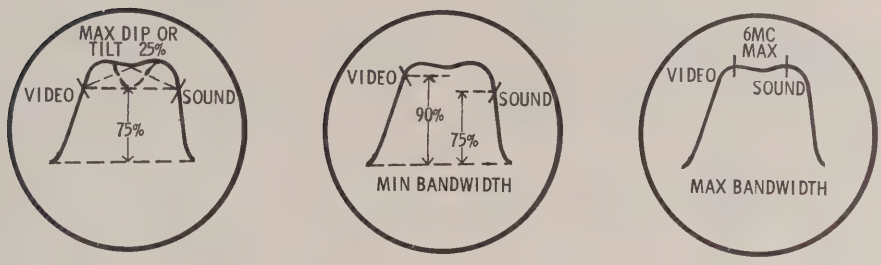


FIG. 202

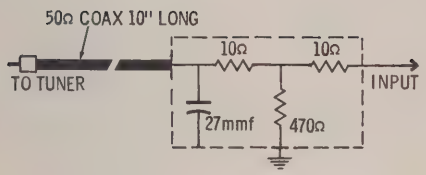


FIG. 203

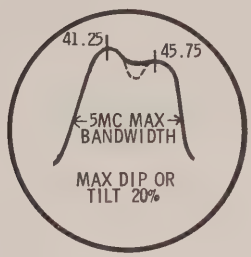


FIG. 204

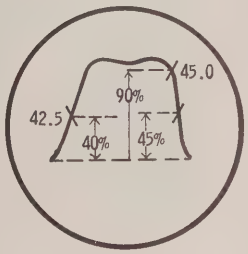
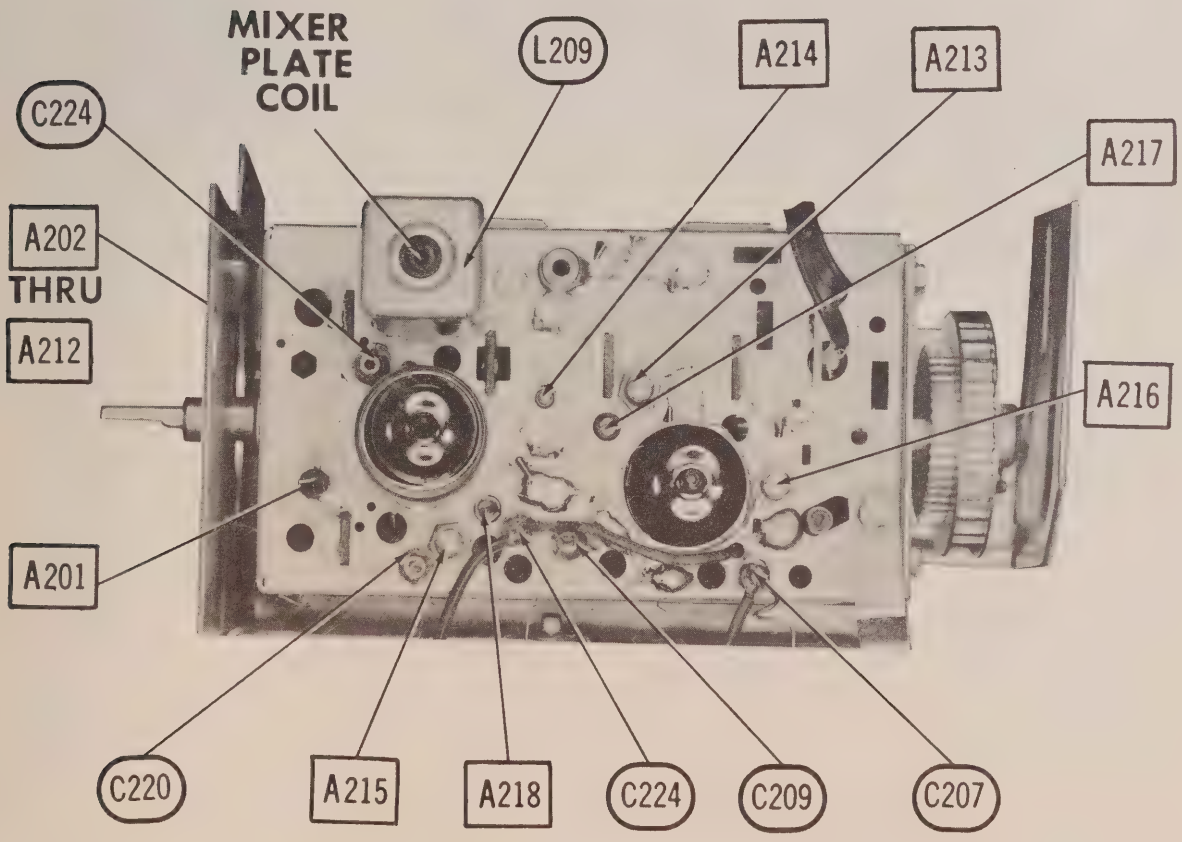


FIG. 205



RF TUNER—TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CQ8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	18		102646						5%
C202	5		102571						NPO 5%
C203	27		100352						NPO 5%
C204	33		102573		TCZ-33				NPO 5%
C205	220		100672	DI-00022	DD-221	L10T22	UC-5322	5GA-T22	
C206	.5-3		103553		829-3		CT565A		
C207	1000		103517	EF-001	MFT-1000			503C-D1	
C208	220		100672		DTZ-220	L10T22		5TCC-T22	10%
C209	1000		103517	EF-001	MFT-1000			503C-D1	
C210	.5-2		103554						
C211	1		77690						10%
C212	.68		71504	NPO-SI .68	TCZ-R68				
C213	270		77838	SI 270	D6-270	LT6T27	UC-5327	5GA-T27	
C214	82		103560	1469-000082	DTZ-82	22R5Q82		MS-482	5%
C215	140-200		103519						2%
C216	.5-3		103552		829-3		CT565A		
C217	470		78622						10%
C218	7		103523			L10V7			10%
C219	1		77690						10%
C220	1000		103517	EF-001	MFT-1000			503C-D1	
C221									
C222	10		103556						N220 5%
C223	68								N150 10%
C224	100		103518	EF-0001	MFT-100			503C-T1	
C225	1000		103517	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	10K		502310	
R202	100K		502410	
R203	1meg		502510	
R204	1meg		502510	
R205	1000Ω		502210	
R206	470Ω		502147	
R207	100K		502410	
R208	100K		502410	

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R209	3300Ω		502233	Note 1
R210	27K 5%		502327	
R211	1000Ω		502210	
R212	5600Ω		502256	
R213	6800Ω		502268	
R214	100Ω		502110	
R215	120Ω		502112	

Note 1. Some versions may use 3900Ω in this application (Part #502239).

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L201	Ant. Matching Coil	73591	
L202	Ant. Matching Coil	73591	
L203	Ant. Coils	103564	Channel 2-13, Stator Assy. includes C205, C211
L204	Neut. Coil	76562	
L205	RF Coils	103562	Channel 2-13, Stator Assy. includes C212, C214, R205, R206

ITEM No.	USE	RCA Victor PART No.	NOTES
L206	Mixer Grid Coils	103563	Channel 2-13, Stator Assy. includes R207, R208, R209
L207	RF Choke	103524	1.5 Microhenries
L208	Osc. Coils	103561	Channel 2-13, Stator Assy. includes C222, C223
L209	Mixer Plate Coil	103516	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M201	Ant. Input Assy.	103525	Includes L201, L202, C201, C202, C203, C204 and trap coils

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	56K	56Ω	0Ω	.1Ω	▲ 680Ω	▲ 680Ω	0Ω		
V2	6DE6	75K	† 80K	0Ω	.1Ω	† 680Ω	† 680Ω	† 80K		
V3	6CB6	.1Ω	180Ω	.1Ω	0Ω	† 4700Ω	† 4700Ω	0Ω		
V4	6AW8A	2200Ω	• 800K	† 33K	.1Ω	0Ω	180Ω	4000Ω	† 5300Ω	† 11K
V5	6AQ5A	470K	• 750Ω	0Ω	.1Ω	† 3900Ω	† 270Ω	470K		
V6	6U8A	† 1meg	† 18K	† 270Ω	0Ω	.1Ω	200K	† 5200Ω	0Ω	2.2meg
V7	6AU6	47K	0Ω	0Ω	.1Ω	† 6200Ω	† 6200Ω	82Ω		
V8	6T8	INF	33K	INF	.2Ω	0Ω	250K	0Ω	0Ω	0Ω
V9	6CG7	† 27K	33K	0Ω	0Ω	.1Ω	• ‡ 4.5meg	• 2meg	0Ω	0Ω
V10	6CZ5	† 150Ω	NC	• 1.3meg	0Ω	.1Ω	• 1.3meg	0Ω	NC	† 430Ω
V11	6CG7	† 0Ω	1.2meg	180K	0Ω	.1Ω	† 47K	180K	0Ω	0Ω
V12	6DQ6A	NC	0Ω	NC	† 5600Ω	1meg	NC	1Ω	100Ω	TOP CAP ‡ 15Ω
V13	6AU4GTA	NC	NC	¶ 4meg	NC	† .5Ω	NC	.1Ω	0Ω	
V14	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 110Ω
V15	5AS4A	NC	¶ 20K	NC	3.4Ω	NC	3.7Ω	NC	¶ 20K	
V16	21CEP4	0Ω	470K	‡ 290K	† 0Ω	NC	NC	• 210K	.1Ω	
V17	6CG7	†† 140K	2.7meg	3300Ω	18Ω	18Ω	†† 7500Ω	• 0Ω	27K	0Ω
V18	6CG7	†† 88K	470K	3300Ω	19Ω	18Ω	†† 33K	78K	25K	0Ω
V19	6V6GT	NC	19Ω	†† 220Ω	†† 1800Ω	470K	TP	18Ω	270Ω	
V20	6V6GT	NC	19Ω	†† 230Ω	†† 1800Ω	470K	TP	18Ω	270Ω	
V21	5Y3GT	NC	¶ 20K	NC	140Ω	TP	130Ω	NC	¶ 20K	
V201	6BQ7A	† 1800Ω	† 500K	† 600K	0Ω	.1Ω	† 600K	270K	0Ω	0Ω
V202	6CQ8	† 920Ω	100K	INF	.1Ω	0Ω	INF	0Ω	INF	INF
		BASE	EMITTER	COLLECTOR						
X1	2N180	20K	10K	28K	TRANSISTOR REMOVED FOR RESISTANCE MEASUREMENTS					

¶ THIS READING MAY VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

▲ MEASURED FROM PIN 7 OF V2.

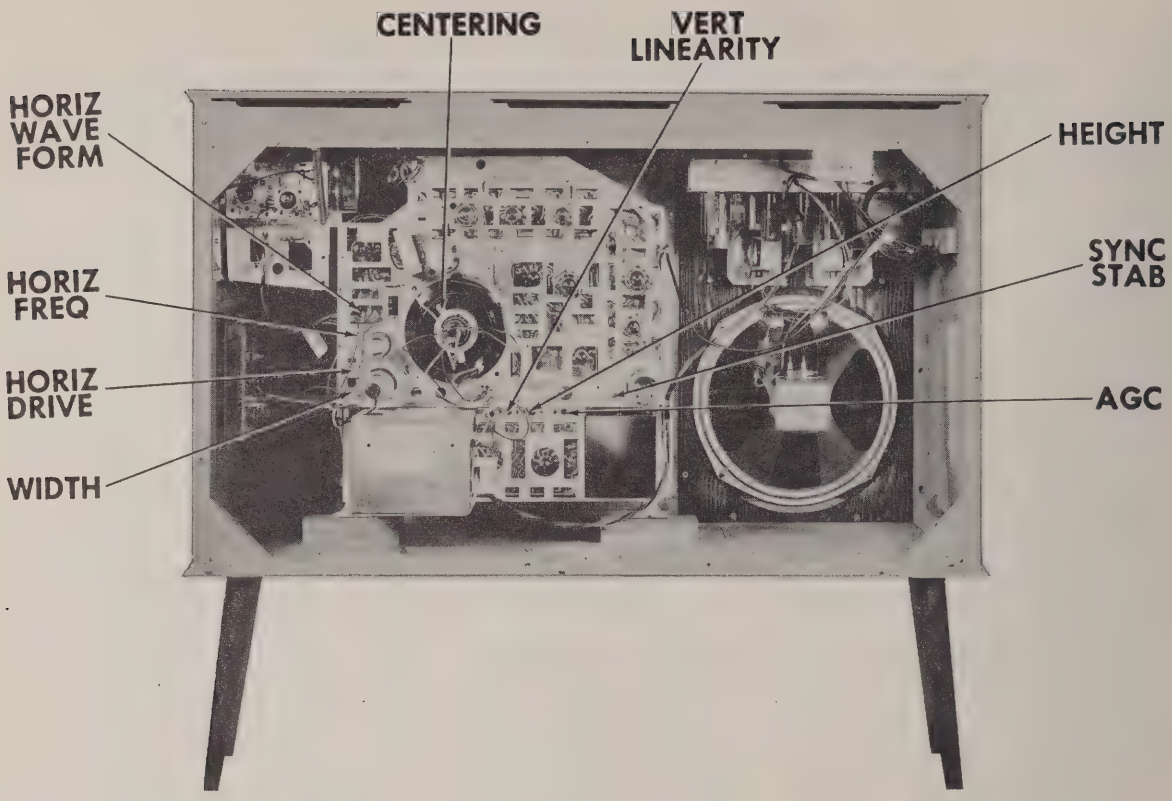
† MEASURED FROM 280V SOURCE.

‡ MEASURED FROM PIN 3 OF V13.

†† MEASURED FROM 315V SOURCE.

NC NO CONNECTION.

TP TIE POINT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short clip lead across the Horizontal Waveform coil (L21) and adjust the Horizontal Hold control until the picture pulls into sync. Remove the clip lead.

Connect the vertical amplifier of a scope thru a low capacity probe to point (F). Low side to chassis. Turn the Horizontal Hold control clockwise until the picture falls out of sync, then counterclockwise until the picture just pulls into sync. Adjust the Horizontal Waveform slug (B1) until the waveform on the scope appears similar to that shown in Fig. 5 with peaks of equal amplitudes. If necessary, during this adjustment, keep the picture in sync with the Horizontal Hold control. Remove the scope connections.

Turn the Horizontal Hold control until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the control counterclockwise and note the number of diagonal bars obtained just before the picture falls into sync. Pull-in should occur with one and one-half to three bars present. Set the Width slug (B2) fully counterclockwise.

With the Horizontal Hold control set at the pull-in point, adjust the Horizontal Drive trimmer (B3) counterclockwise until a bright vertical line appears in the center of the picture. Turn B2 clockwise until the drive line disappears. If no drive line appears, set B3 counterclockwise.

Set the Brightness and Contrast controls to normal and adjust the Width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

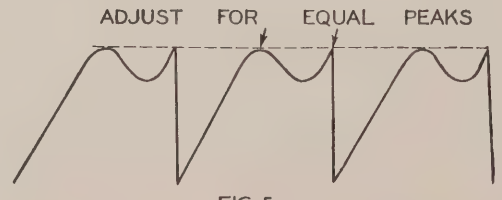


FIG. 5

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs from the front.
2. Remove 5 wood screws from the rear cover. Remove the rear cover.
3. Remove 2 wood screws holding the antenna terminal board.
4. Remove the speaker leads, picture tube socket, HV lead and yoke clamp.
5. Remove 2 wood screws holding the top chassis brace.
6. Remove 4 chassis bolts from the bottom.
7. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting the chassis.

MODEL 2D1830

TRUETONE MODELS 2D1830A, 2D1831A, 2D1832A, 2D1833A, 2D2830A, 2D2831A, 2D2832A, 2D2833A

TRADE NAME	Truetone	MODELS
		2D1830A, 2D1831A, 2D1832A, 2D1833A, 2D2830A, 2D2831A, 2D2832A, 2D2833A
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.	
TYPE SET	Television Receiver	
TUBES	Fourteen	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 145 Watts, 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the rear cover. Supply power to the receiver. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, through a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws from the trim at the top of the safety glass. Tilt glass out at the top and lift up to remove.

FOCUS

Adjust the beam alignment magnet on the neck of the picture tube for best focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSE DEVICE

A 7.5Ω fusible resistor (R62) is used for LV power supply protection. (For location, see tube placement chart).

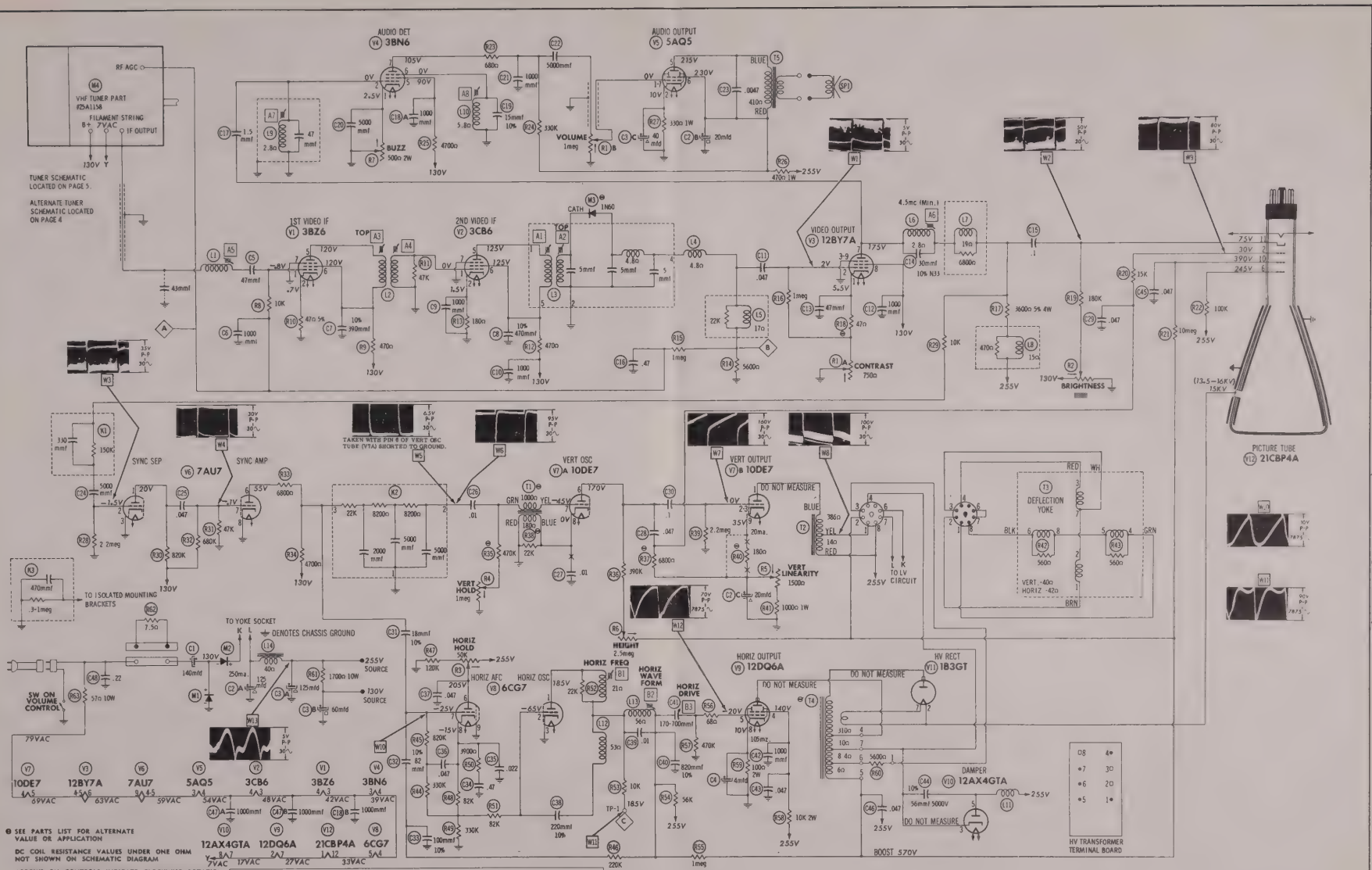
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H402R



❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

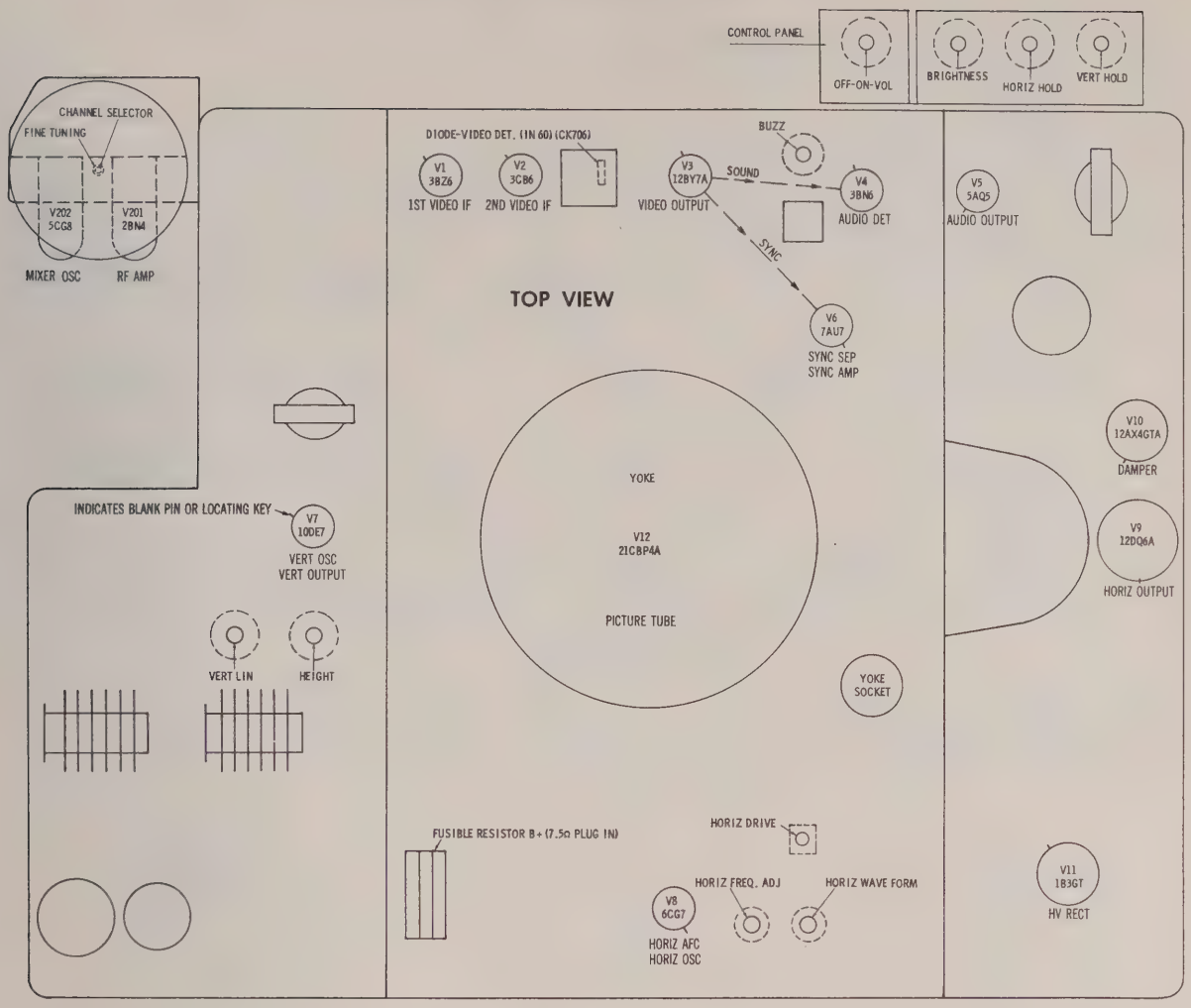
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation; no signal applied

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

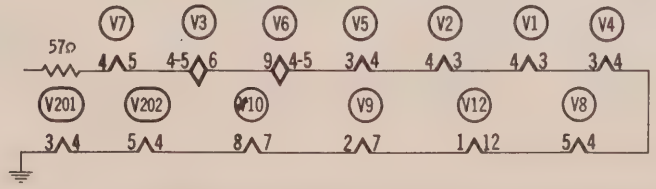
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R62), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, Diode (M3), V3**
No pic, no sound, has snow - **V201, V202**
No pic, has sound, has raster - **V3, V12**
Has pic, no sound - **V4, V5**

SYNC FAILURE
No vert. sync - **V6**
No horiz. sync - **V6, V8**
No vert. or horiz. sync - **V6**

SWEEP FAILURE
No raster, has sound - **V8, V9, V10, V11, V12**
No vertical deflection - **V7**
Poor vert. linearity of foldover - **V7**
Poor horiz. linearity or foldover - **V8, V9, V10**
Narrow picture - **V8, V9, V10, M1, M2**
Vert. off freq. - **V7**
Horiz. off freq. - **V8**

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



SET 403 FOLDER 4

TRUETONE MODELS 2D1830A, 2D1831A, 2D1832A, 2D1833A, 2D2830A, 2D2831A, 2D2832A, 2D2833A

FOLDER 4

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Keep sweep generator output set for approximately 4 volts peak to peak on the scope throughout the "Video IF Alignment".

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3CB6 (V2). Low side to chassis.	44.0MC (10MC Swp)	42.8MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across video det. load).	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	"	High side to pin 1 (grid) of 3BZ6 (V1). Low side to chassis.	"	42.8MC 43.9MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
3.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	"	"	"	"	A5, Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. If necessary, repeat steps 1, 2, and 3.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.005mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A6	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength by use of an attenuator, or similar device, until a hiss is heard in the sound.
Adjust A7, A8 and buzz control (R7) for maximum undistorted sound and MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

FOR TUNER ALIGNMENT INSTRUCTIONS SEE PAGE 6.

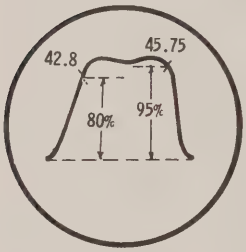


FIG.1

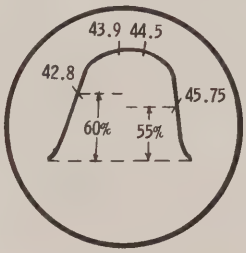


FIG.2

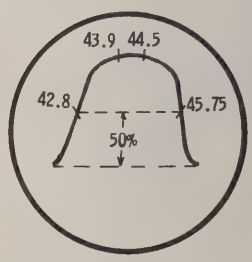
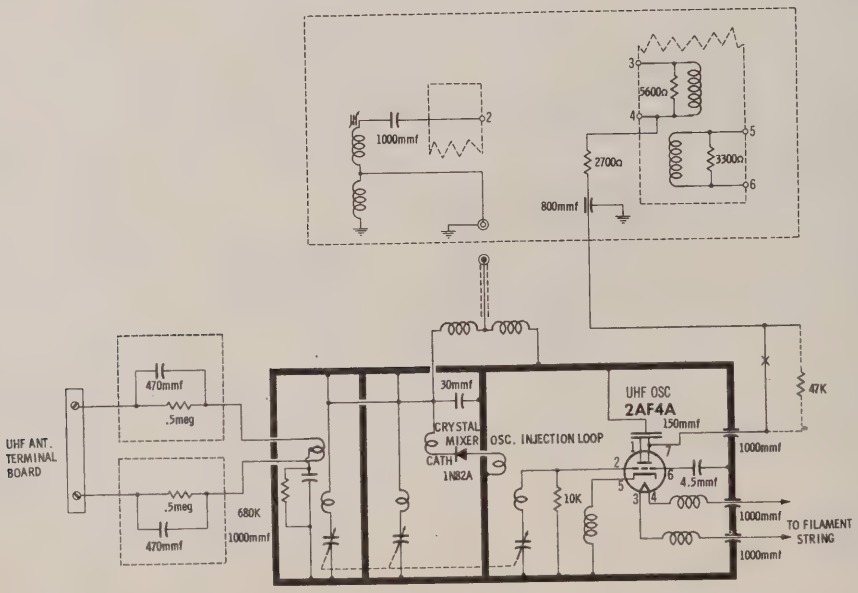
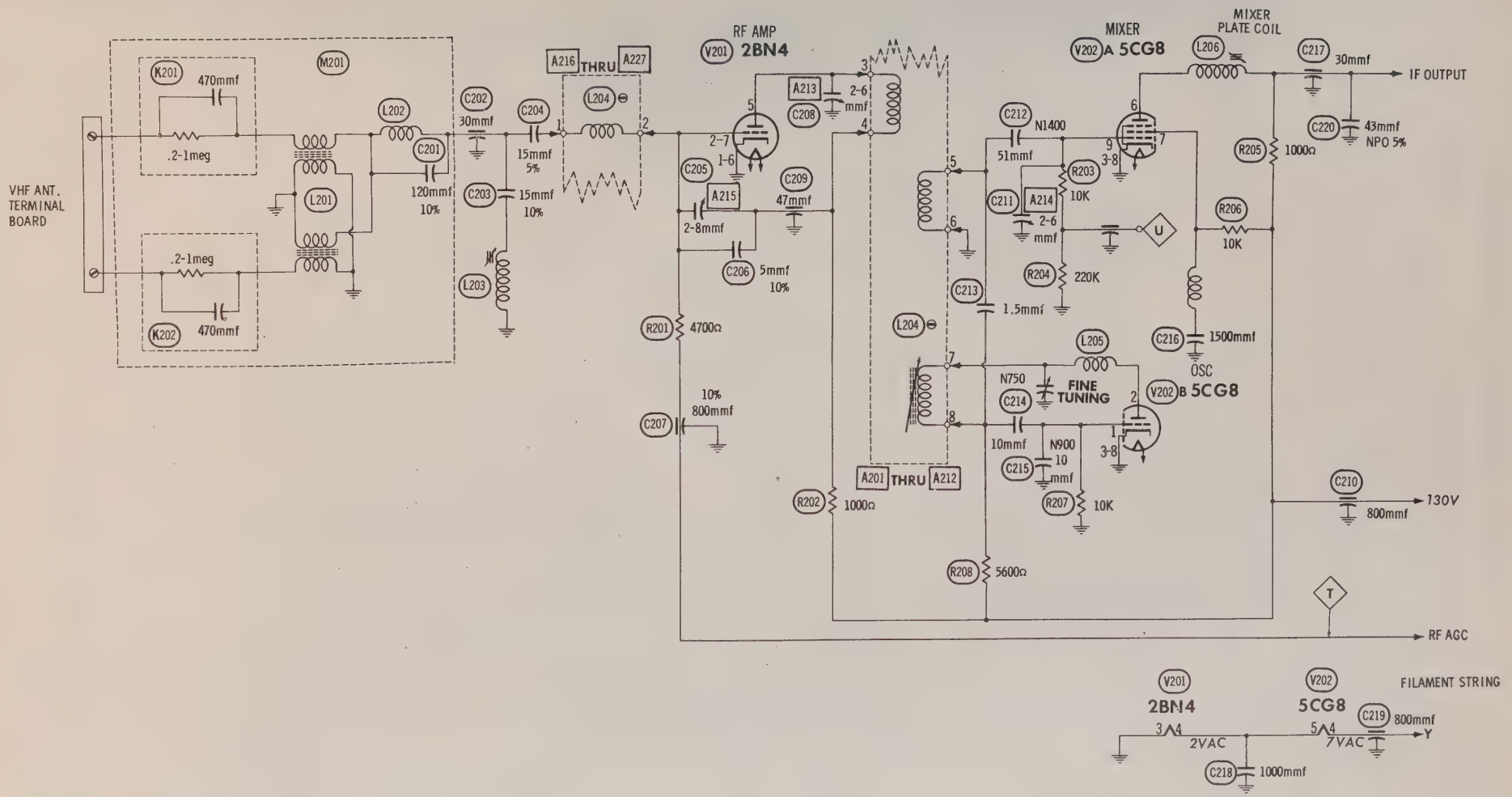


FIG.3



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF TUNER #25A1159



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER #25A1158

TRUETONE MODELS 2D1830A, 2D1831A, 2D1832A, 2D1833A, 2D2830A, 2D2831A, 2D2832A, 2D2833A

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point ⓓ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point ⓓ . Low side to chassis.	A213, A214	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202.
3.	"	"	"	"	"	Vert. Amp. thru detector (Fig. 203) to plate of 1st. video IF tube. Low side to chassis.	A215	Reduce bias to -1.5 volts. Adjust for MINIMUM response.
4.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

ANTENNA TRAP ALIGNMENT

Some types of interference can be reduced by adjusting A228. Observe the picture and adjust A228 for MINIMUM interference.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

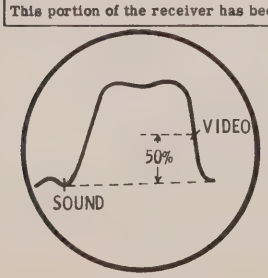


FIG.201

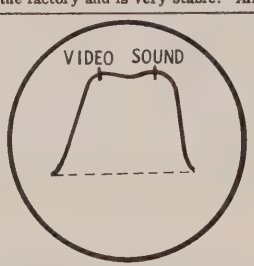


FIG.202

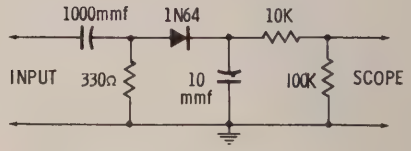


FIG.203

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. Video IF Amp.	3BZ6	
V2	2nd. Video IF Amp.	3CB6	
V3	Video Output	12BY7A	
V4	Audio Det.	3BN6	
V5	Audio Output	5AQ5	
V6	Sync Sep. -Sync Amp.	7AU7	

ITEM No	USE	TYPE	NOTES
V7	Vert. Osc. -Vert. Output	10DE7	
V8	Horiz. AFC-Horiz. Osc.	6CG7	
V9	Horiz. Output	12GN6A	
V10	Damper	12AX4GTA	
V11	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	TRUETONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V12	21CBP4A		21CBP4-A ↓	21CBP4/ 21CBP4A ②	①"Silverama" ③ ② "Silver Screen 65"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA							
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	
C1	140	150	45X421	AFHB1-23	KA02B1	FP117	TM8-24	T-055	TVL-1438	
C2A	⌀25	300	45X431	AFH4-02-60	BQ280	FP221B		Q-248	*R3276	
B	⌀20	300			BBR20-150	TC36		MT-3516		
C	⌀20	50								
C3A	⌀25	300	45X420	AFH3-99-82	C0046	FP420.75	TMT-26	T-115	TVL-3574.6	
B	⌀60	300			BR50S	TC65		MT-0550		
C	⌀40	50								
C4	4	50	45X418	PRS150V4	BBR4-50	TC30	TD-4-50	MT-0504	TE-1303	

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	47			SI 47	D5-470	LT5Q47	GP-47	UC-5447	5GA-Q47	
C6	1000			BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C7	390				D5-391	5R5T39	ED-390		MS-339	10%
C8	470				D5-471	5R5T47	ED-470		MS-347	10%
C9	1000			BPD-001	DD-103	BYA5D1	ED-1000	DC521	5HK-D1	
C10	1000			BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C11	.047	200		P288N-047	DF-503	CUB4S47		GEM-4147	5TM-S47	
C12	1000			BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C13	47			SI 47	D5-470	LT5Q47	GP-47	UC-5447	5GA-Q47	
C14	30									N33 10%
C15	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C16	.47	200		P288N-47		CUB2P47		GEM-3047	2TM-P47	
C17	1.5			NPO-S11.5	TCZ-1R5	C10V15C	TCO-1.5	ZT-5515	5TCCB-V15	
C18A	1000		80X3	BPD-2X001	DD2-102	BYC5DD1	ED2-001	DC5D21	5HK-2D1	
B	1000									
C19	15			NPO-D1 15	DD-150	L10Q15	ED-15		5TCC-Q15	10%
C20	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C21	1000			BPD-001	DD-103	BYA5D1	ED-1000	DC521	5HK-D1	
C22	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C23	.0047	600		P688N-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C24	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C25	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C26	.01	400		P488N-01	D5-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C27	.01	400		P488N-01	D5-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C28	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C29	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C30	.1	800		P868N-1	DF-104	CUB8P1		GEM-601	8TM-P1	
C31	18		RCM30B180K	1469-000018	D8-180	22R5Q18	ED-18		MS-418	10%
C32	82		RCM30B820K	1469-000082	D8-820	22R5Q82	ED-82		MS-482	10%
C33	100			1469-0001	D8-101	22R5T1	ED-100	MCB235	MS-31	10%
C34	.47	200		P288N-47		CUB2P47		GEM-2047	2TM-P47	
C35	.022	200		P288N-022	DD-303	CUB4S22	ED-02	GEM-4122	2TM-S22	
C36	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C37	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C38	220			1469-00022	D8-221	22R5T22	ED-220		MS-322	10%
C39	.01	400		P488N-01	D5-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C40	820		RCM20B821K	1464-00082		1R5T82	CY15C821K		MS-382	10%
C41	170-700		17A371							
C42	1000			BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C43	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C44	56	5000	47X755							10%
C45	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C46	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C47A	1000		80X3	BPD-2X001	DD2-102	BYC5DD1	ED2-001	DC5D21	5HK-2D1	
B	1000									
C48	22	400		P488N-22		CUB4P22		GEM-4022	4TM-P22	

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	750Ω	½	78X30	F1-2	RTV-546	♦ UJ-1074	♦♦ UE37698	Contrast
B	1meg	½		R2-51	Not Req.			Volume
C	Switch			KB-1	Not Req.			
R2A	500K	½	40X423	B-59	A47-500K-S	QU-123	TA55L	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	50K	½	40X424	B-31	A47-50K-S	QU-123	TA54L	Horiz. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	40X425	B-59	A47-1meg-S	QU-137	TA6L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1500Ω	½	40X396	AB-6	A47-1500-S	QU-109	TAP152L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6A	2.5meg	½	40X398	BX-53	A47-2.5meg-S	QU-239	TA255L	Height
B	Shaft			Not Req.	FK3-1/4	TQ	Not Req.	
R7	500Ω	2(WW)	40X397		39-500		FL-500	Buss

♦ "Concentrikit" Equivalent: K-3 Kit, Base Elements & Shafts RU-105, P6-102 (Panel) RU-137, RI-126 (Rear) 78-1 (Switch)

♦♦ "STA-LOC" Equivalent: FA75IL, OF125A, RU16L, RI675, U8-4L

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R8	10K			
R9	470Ω			
R10	47Ω 5%			
R11	47K			
R12	470Ω			
R13	180Ω			
R14	560Ω			
R15	1meg			
R16	1meg			
R17	3600Ω 5%	4	43X331	
R18	47Ω			
R19	180K			
R20	15K			
R21	10meg			
R22	100K			
R23	680Ω			
R24	330K			
R25	4700Ω			
R26	470Ω	1		
R27	330Ω	1		
R28	2.2meg			
R29	10K			
R30	820K			
R31	47K			
R32	680K			
R33	6800Ω			
R34	4700Ω			
R35	470K			

ITEM No	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R36	390K			
R37	6800Ω			
R38	22K			
R39	2.2meg			
R40	180Ω			
R41	1000Ω	1		
R42	560Ω			
R43	560Ω			
R44	330K			
R45	820K			
R46	220K			
R47	120K			
R48	82K			
R49	330K			
R50	3900Ω			
R51	82K			
R52	22K			
R53	10K			
R54	56K			
R55	1meg		B84105	
R56	68Ω			
R57	470K			
R58	10K	2		
R59	100Ω	2		
R60	5600Ω			
R61	17000Ω	10	43X294	
R62	7.5Ω		43X380	
R63	57Ω	10	43X301	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Osc.	54X9-A	B6702	A-3003	V402	A-8125	26A03	A-97X	
	Alt. Vert. Osc.	54X19							
T2	Vert. Output	51X186	Z1900 ②	A-3038 ①③	V307 ①③	VO-100 ③	26S73 ③	A-118X ③	
T3A	Yoke-Horiz. (24.5MH)	93A403 ④	DF607	MDF-92	Y90F10/43	DY-16A	Y-16	Y-45 & NW21	
B	(90°)-Vert. (39MH)		⑤	⑤	⑤	⑤	⑤		
M5	Rear Cover & Centering Device	2A435						YC1	
	Yoke Clamp	30X501						CL-1	
T4	Horiz. Output	53X363C	FB419	HVO-36	XO94	HO-283 *	FLY-16	D-121 *	
			③ *§	③ * §	③ * §		③ *§		
	Alt. Horiz. Output	53X363	FB419	HVO-36		HO-283 *	FLY-16	D-121 *	
			③ *2	③ * §	③ * §		③ *§		

① Connect as autoformer.
② Use 9 to 1 turns ratio.
③ Drill new mounting hole(s).
④ Includes resistors (R43, R43).
⑤ Use original rear cover, centering device and horizontal damping network. Connect same as original.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	9	9	9	8	9	4
7	7	7	7	3	7	3
6	See Note ⑥ NC	See Note ⑥ NC	See Note ⑥ NC	2	See Note ⑥ NC	2
5	1	1	1	1	1	1

⑥ Install new damping network consisting of approximately 50mmf in series with resistor (R60) across horizontal yoke terminals #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	6100Ω	3-4Ω	51X165	Z1110	A-3028	AU-603	A-3877 ①	24S43	S-5X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	12A527	5A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	1st. Video IF	9A2389	17-4534	TV-131	4202	VF-4	
L2	2nd. Video IF	9A2390					
L3	3rd. Video IF	9A2391					Complete Assy.
L4	Resonant Choke	9A2375					30 Microhenries
L5	Shunt Peaking Coil	36A32	19-3300 *	TV-199 *	6155 *		290 Microhenries, wound 22K resistor
L6	4.5MC Trap	9A2366	20-1004	TV-151	1469 ▲	SF-3	
L7	Series Peaking Coil	36A28	19-6400 ●	TV-190 ●	6133 ●	VP-7 ●	350 Microhenries, wound on 6800Ω resistor
L8	Shunt Peaking Coil	36A38	19-4301 †	TV-197 †	6154 †		220 Microhenries, wound on 4700Ω resistor
L9	Sound IF	9A2400	17-1026	TV-154	1470A ▲		
L10	Quadrature Coil	9A2367	20-1005	TV-121	1480		
L11	RF Choke	9A2380	19-1001	BC-562	4904		1.5 Microhenries

* Parallel with 22K resistor.
● Parallel with 6800Ω resistor.
† Parallel with 4700Ω resistor.
▲ Enlarged tap.
▲ Drill mounting holes.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	Thordarson PART No	
L12	74Ω *		9A2371		TV-165	6211 ▲		22S-7	Horiz. Freq. * Tapped @ 53Ω Horiz. Waveform. ▲ Enlarge mounting hole.
L13	56Ω		9A2372			6215		22S-5	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 ~(.)	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	250A	40Ω	1 Hy	52X96-6	C5037 ①	C-2991 ①		C-2328 ①	26C41	C-27X

↓ Drill new mounting hole

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRUETONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.		
M1	.250A	66X14-C ①	1090A ①	1N607 ②	RS300SL ①	300 ③	① Selenium type.	
					SD94A ③	M500 ④	② Germanium type.	
M2	.250A	66X14-C ①	1090A ①	1N1007 ②	RS300SL ↓	300 ③	③ Silicon type.	
					SD94A ③	M500 ④		

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRUETONE PART No.	CBS PART No	SYLVANIA PART No	
M3	1N80 *		1N80	1N80	Video Detector (Pigtail)

* Some versions may use CK706 in this application.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	TRUETONE PART No	REPLACEMENT DATA	
K1	Sync Coupling	330mmf, 150K	76X13	Sprague	PRC-5
K2	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 82000 82000	76X7	Aerovox	PA-110
				Centralab	PC-104
				Cornell-Dubilier	115TM1
				Erie	1405-01
				Sprague	V-1
K3	Chassis Isolation	470mmf, .3-1meg	76X11	Centralab	RC-471
				Sprague	R-9177

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	25A1158	VHF
	Tuner	25A1159	UHF
M5	Centering Device	2A435	Includes Yoke Rear Cover
	Magnet	2A479	Beam alignment used in some versions

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

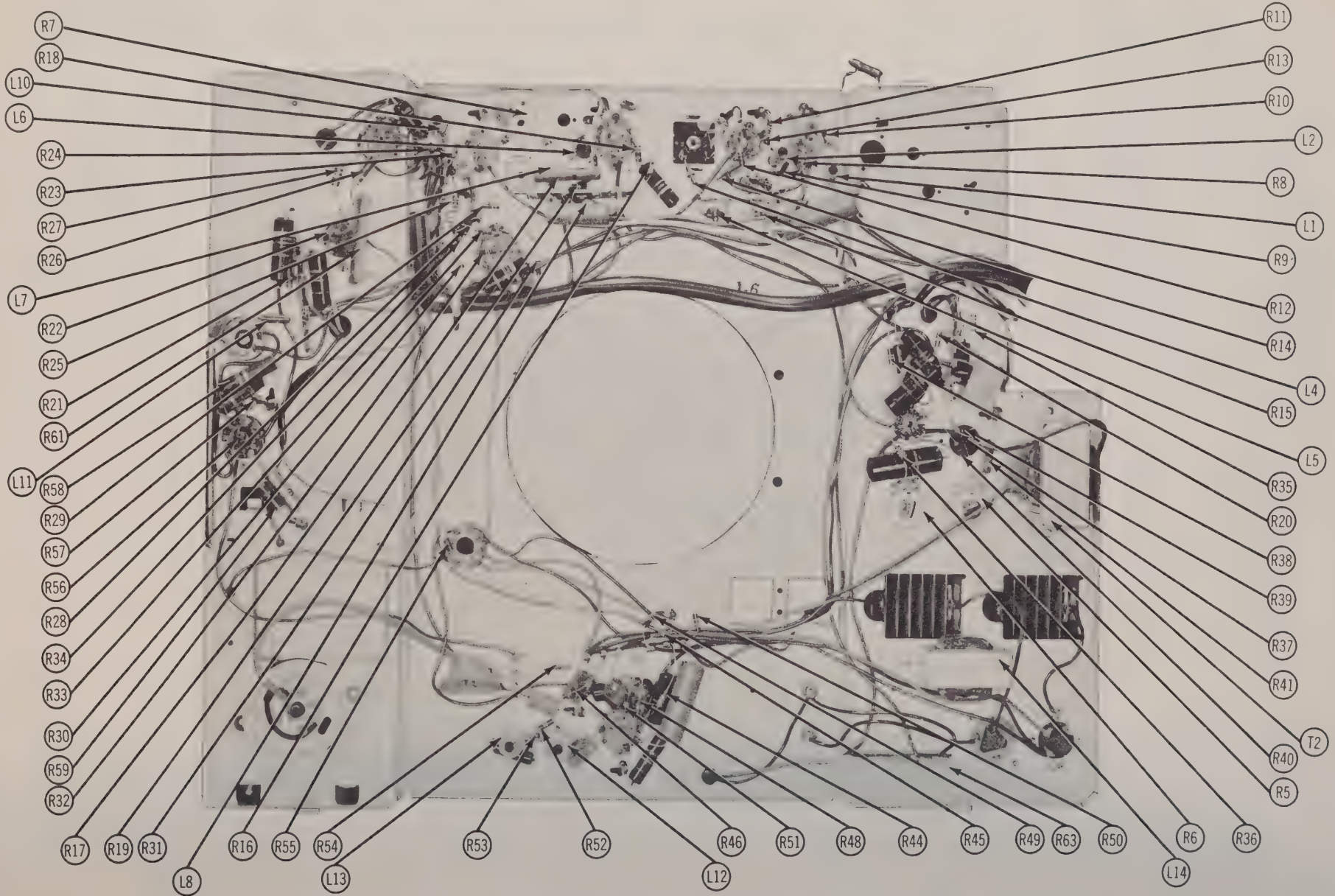
NAME	PART NO.	DESCRIPTION
Safety Glass	17X194-1	Dark *
Safety Glass	17X194-2	Clear *
Mask	S-38A345	*
Knob	10A863-2	Channel Selector (Brown) *
Knob	10A857-2	Fine Tuning (Brown) *
Knob	10A897-1	On-off-volume (Brown) *
Knob	10A896-1	Contrast (Brown) *
Knob	10A898-1	Secondary Controls (Brown) *
Knob	10A863-4	Channel Selector (Gray) *
Knob	10A857-4	Fine Tuning (Gray) *
Knob	10A893-2	UHF Tuning (Gray) *
Knob	10A894-2	UHF Indicator (Gray) *
Knob	10A897-3	On-off-volume (Gray) *
Knob	10A896-3	Contrast (Gray) *
Knob	10A898-3	Secondary controls (Gray)*

WIRING DATA

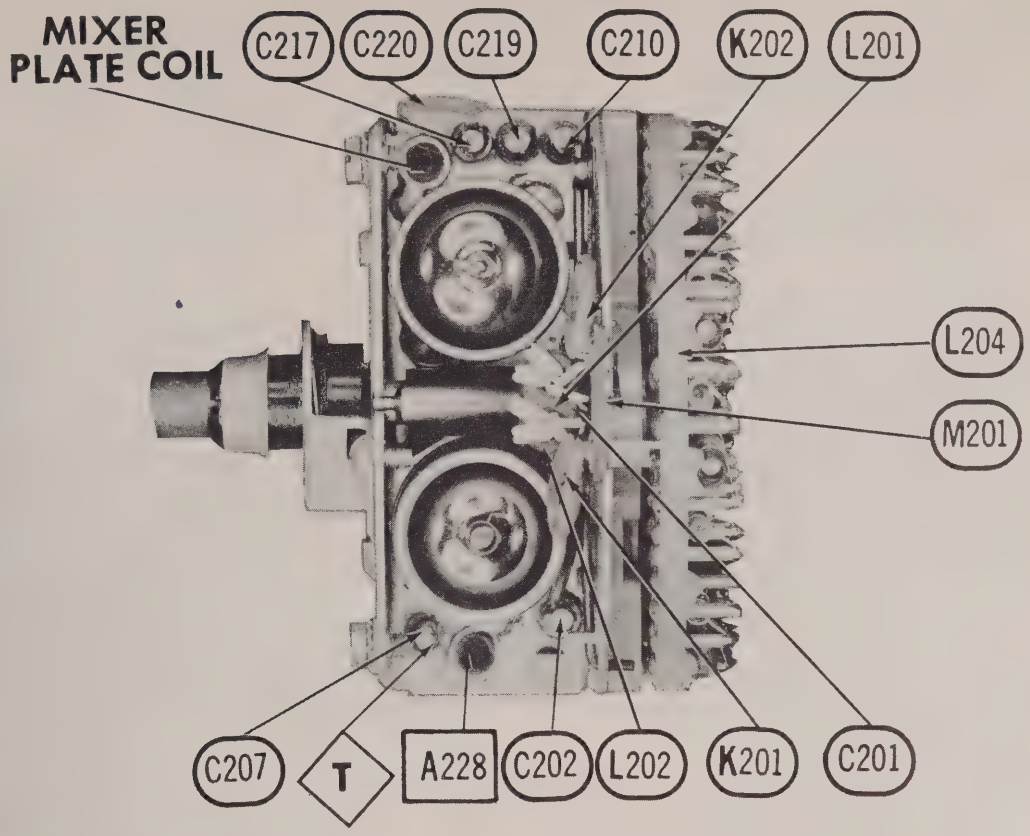
High Voltage Lead	Use BELDEN No. 8969
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8494 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8498 (Round) - 8 Conductor

TRUETONE MODELS 2D1830A, 2D1831A, 2D1832A, 2D1833A, 2D2830A, 2D2831A, 2D2832A, 2D2833A

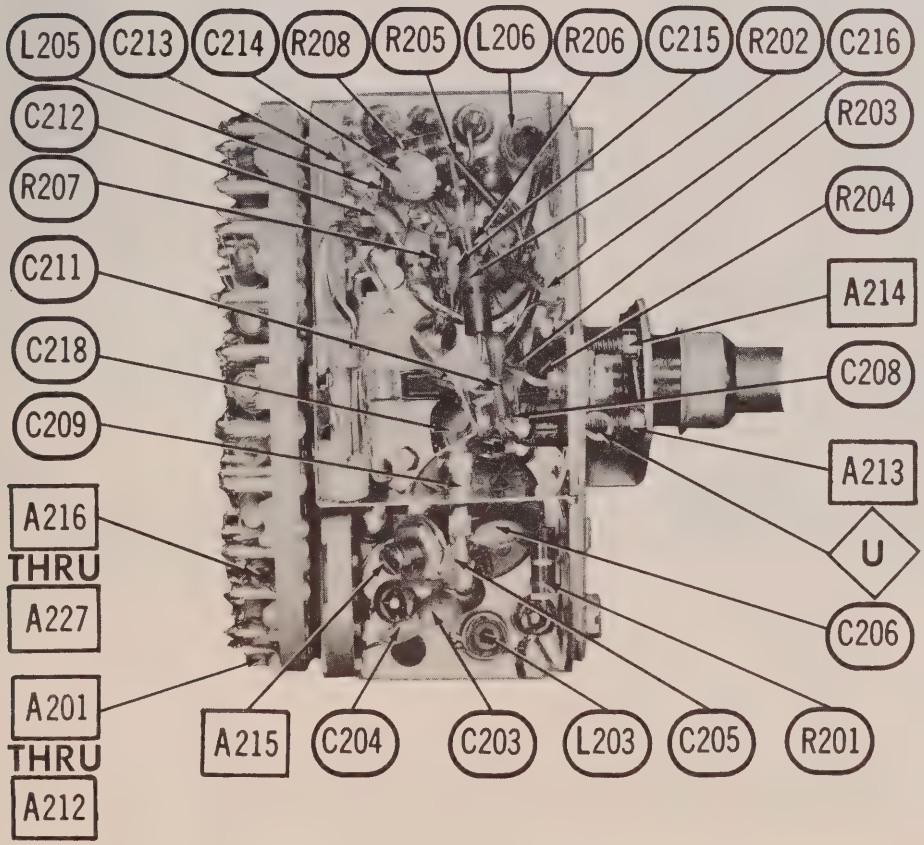
FOLDER 4



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	2BN4	
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	TRUETONE PART No.	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	120			NPO-DI 120	DD-121	L10T12	ED-120		5TCC-T12	10%
C202	30									
C203	15			NPO-DI 15	DD-150	L10Q15	ED-15		5TCC-Q15	10%
C204	15				TCZ-15		TCO-15			5%
C205	2-8									
C206	5			NPO-DI 5	DD-050	C10V5C	ED-5	ZT-555	5TCC-Q5	10%
C207	800									10%
C208	2-6									
C209	47									
C210	800									
C211	2-6									
C212	51									N1400
C213	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	TCO-1.5	ZT-5515	5TCCB-V15	
C214	10			N750-SI 10	TCN-10	CTA6Q1U	TC7-10	NT-541	5TCU-Q1	N750
C215	10									N900
C216	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	①
C217	30									
C218	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C219	800									
C220	43									NPO 5%

① Some versions may use 1000mmf in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	NOTES
R201	4700Ω			
R202	1000Ω			
R203	10K			
R204	220K			
R205	1000Ω			
R206	10K			
R207	10K			
R208	5600Ω			

COILS (RF-IF)

ITEM No.	USE	TRUETONE PART No.	NOTES
L201	Ant. Trans.	31T-3066	
L202	IF Trap Coil	34A763	
L203	IF Trap Coil	34A762	
L204	Coil Assy.	31T-3068-004	Includes rotor
L205	Osc. Plate Coil	25A-211-01	
L206	Mixer Plate Coil	31U-580	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .2-1meg	13P-198	
K202	Antenna Isolation	470mmf, .2-1meg	13P-198	

MISCELLANEOUS

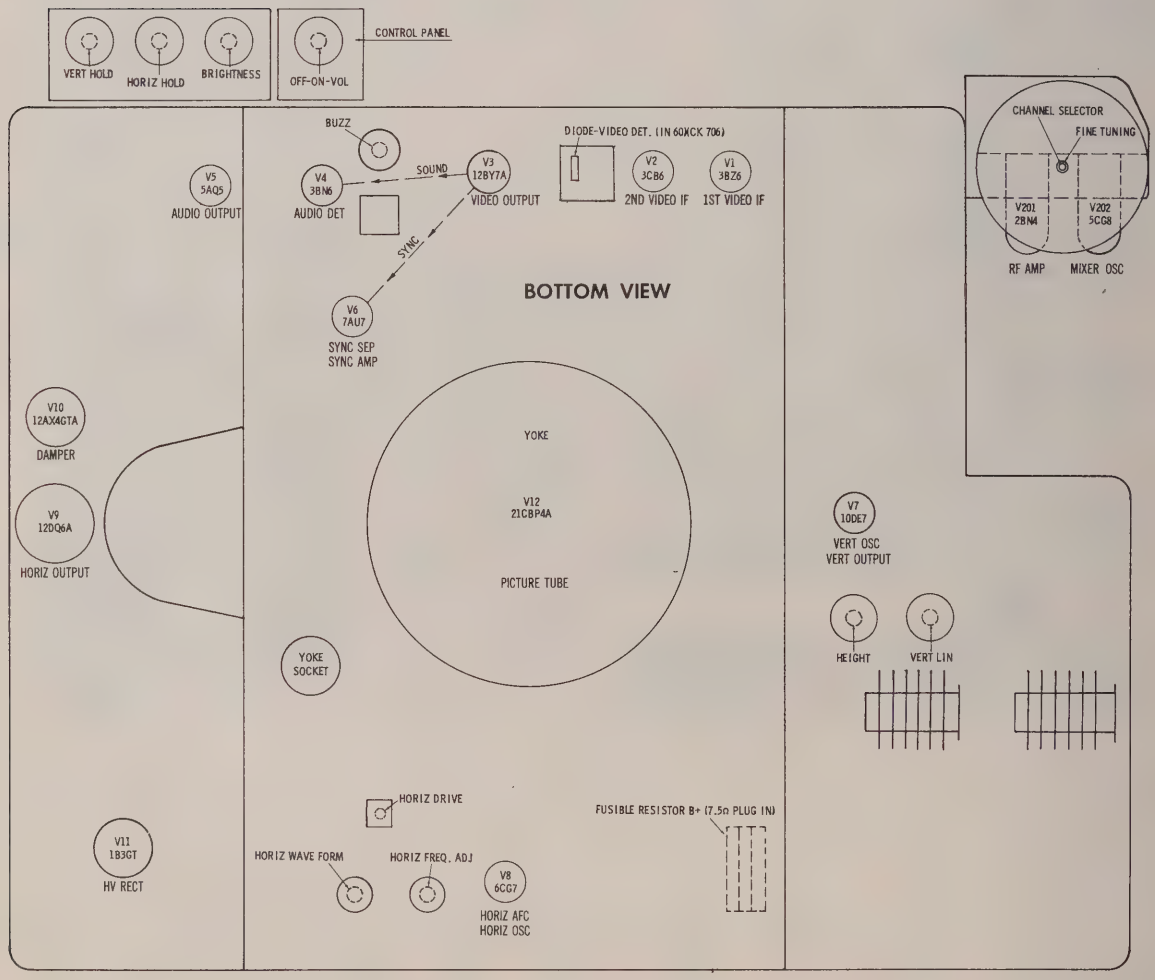
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M201	Antenna Input Assy.	31T-2086-01	Includes L201, L202, K201, K202
	Osc. Slug	15A-276	(12 Used)
	Contact Spring	23A-132	(6 Used)

CHASSIS TOP VIEW

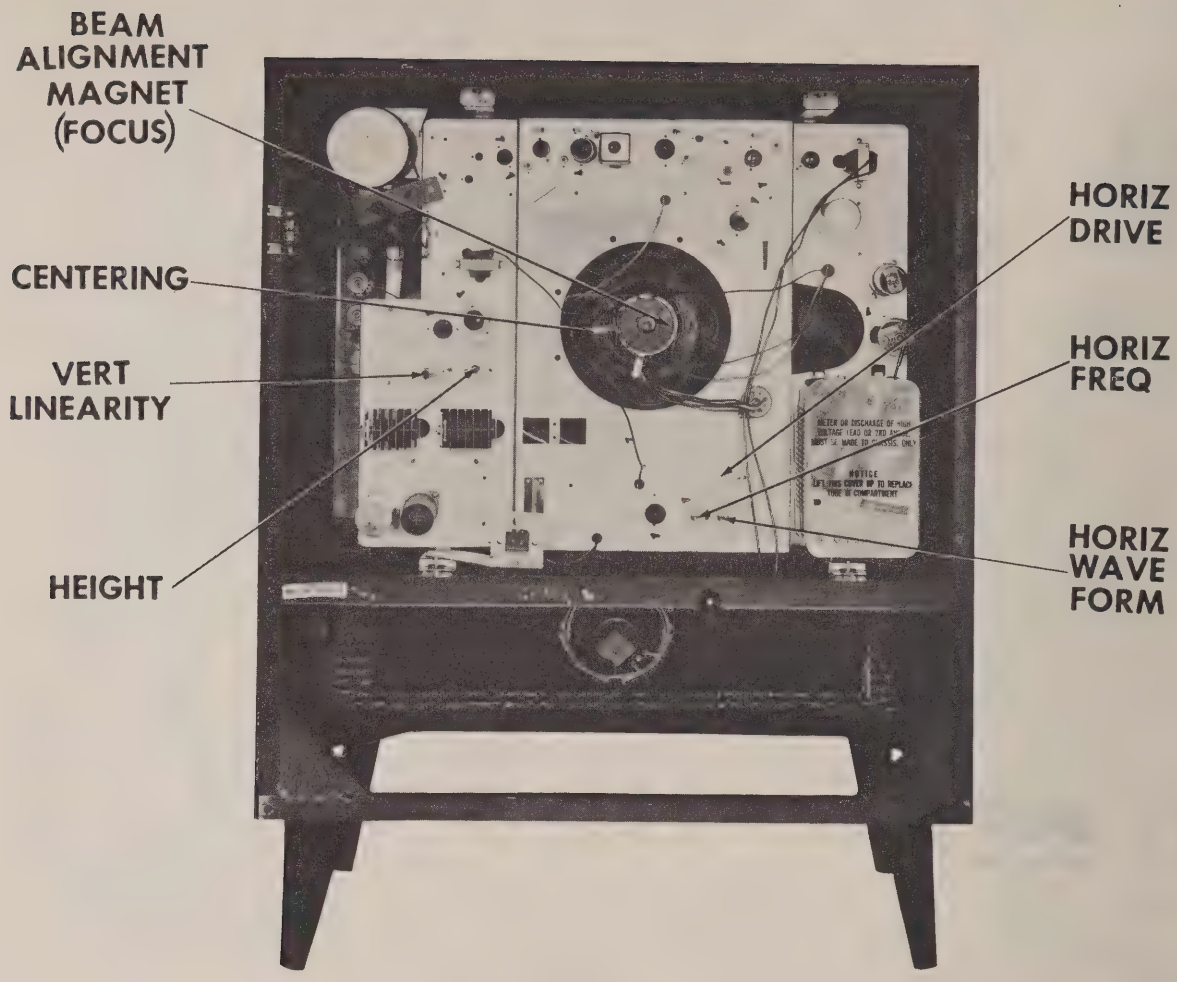
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1meg	47Ω	10Ω	11Ω	† 2200Ω	† 2200Ω	0Ω		
V2	6CB6	.1Ω	180Ω	11Ω	12Ω	† 2200Ω	† 2200Ω	0Ω		
V3	12BY7A	• 230Ω	1meg	0Ω	17Ω	17Ω	14Ω	† 3600Ω	† 1700Ω	0Ω
V4	3BN6	• 290Ω	2.8Ω	10Ω	9.5Ω	† 6400Ω	5.8Ω	† 330K		
V5	5AQ5	0Ω	330Ω	13Ω	12Ω	† 880Ω	† 470Ω	0Ω		
V6	7AU7	† 820K	2.2meg	0Ω	13Ω	13Ω	† 13K	47K	0Ω	14Ω
V7	10DE7	† 400Ω	2.2meg	2.2meg	18Ω	17Ω	• ‡ 1.6meg	• 850K	170Ω	1600Ω
V8	6CG7	† 56K	410K	0Ω	9.5Ω	8.5Ω	• † 220Ω	1.4meg	410K	0Ω
V9	12DQ6A	TP	4Ω	NC	† 10K	470K	NC	7Ω	100Ω	TOP CAP ‡ 10Ω
V10	12AX4GTA	NC	NC	¶	NC	† .1Ω	NC	4Ω	1.5Ω	
V11	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 320Ω
V12	21CBP4A	7Ω	• 23K	PIN 6 † 100K	PIN 10 ‡ 10meg	PIN 11 • 290K	PIN 12 8.5Ω			
V201	2BN4	0Ω	1meg	0Ω	.5Ω	† 2700Ω	0Ω	1meg		
V202	5CG8	10K	† 7300Ω	0Ω	1.5Ω	.5Ω	† 2700Ω	‡ 12K	0Ω	230K

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 255V SOURCE.
‡ MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the contrast control for a normal picture.

Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Connect the vertical amplifier of the scope thru a low capacity probe to point ◇C◇ . Low side to chassis. Adjust the horizontal waveform slug (B2) until the waveform is similar to Fig. 4. While making this adjustment, keep the picture in sync with the horizontal hold control.

Turn the horizontal hold control fully clockwise. Turn B1 clockwise until the picture is just ready to pull in sync.

Turn the horizontal hold control fully counter clockwise. The picture should remain in sync. Switch off channel and back again. Retouch B1 if necessary.

While receiving a signal from a station, turn the contrast control fully counter clockwise and turn the brightness up so that the picture appears to be washed out. Turn the horizontal drive trimmer (B3) clockwise until white vertical bars appear in the left center of the raster, then slowly turn B3 counter clockwise until the bars disappear.

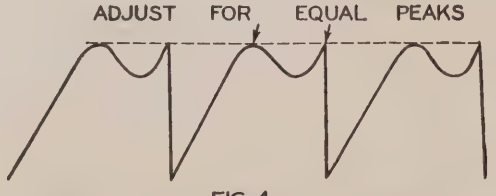


FIG. 4

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRODUCTION CHANGE BULLETIN 211

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 275

McIntosh Model MC-30 was covered in Photofact Folder 9 — Set 275.

The following changes were made during late production.

COMPONENT CHANGES

V7, Rectifier, is changed from 5U4GA to 5U4GB.

R2, Hum adjustment, is 250Ω.

A 180K ½W resistor is added from the junction of C4 and input socket.

C2 is increased from 20mfd to 100mfd.

R11 is decreased from 1meg to 680K.

R15 is decreased in wattage from 1 watt to ½ watt.

R17 is increased from 3000Ω 1W to 30K ½W.

A 220K ½W resistor is added between pins 5 and 8 of V5, Output.

A 220K ½W resistor is added between pins 5 and 8 of V6, Output.

C1A is decreased from 40mfd to 35mfd.

C1C is decreased from 20mfd to 15mfd.

COLOR CODE CHANGED FOR T2 - AUDIO OUTPUT TRANSFORMER

The color code of the hook-up wire for T2, Audio Output Transformer, has been changed. A partial schematic showing the new color code is given on the reverse side.

MCINTOSH MODEL MC-30

(Continued on Reverse Side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 344

McIntosh Model MC-60 was covered in Photofact Folder 10 — Set 344.

The following changes were made during late production.

COMPONENT CHANGES

V7 and V8, Rectifiers, are changed from 5U4GA to 5U4GB.

C1C is decreased from 20mfd to 15mfd.

R10 is increased from 540K to 560K.

C1A is decreased from 40mfd to 35mfd.

C2A is decreased from 40mfd to 35mfd.

C2C is decreased from 20mfd to 15mfd.

COLOR CODE CHANGED FOR T2-AUDIO OUTPUT TRANSFORMER

The color code of the hook-up wire for T2, Audio Output Transformer, has been changed. A partial schematic showing the new color code is given on the reverse side.

MCINTOSH MODEL MC-60

(Continued on Reverse Side)

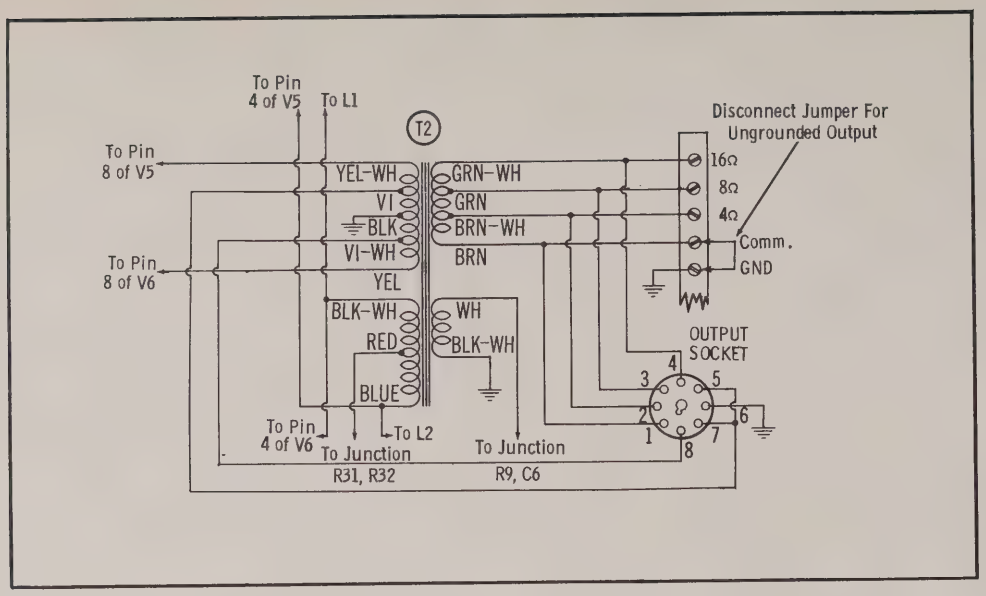
PRODUCTION CHANGE BULLETIN 211

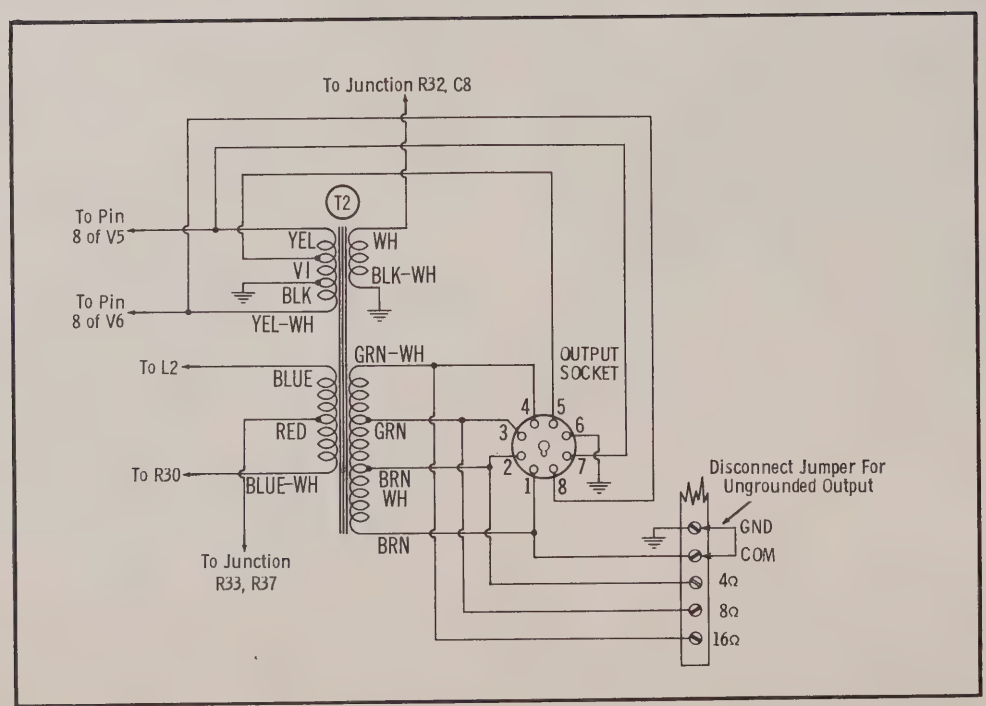
PRODUCTION CHANGE BULLETIN 211

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

SET 403 FOLDER 5


To Pin
4 of V5
To L1
T2
Disconnect Jumper For
Ungrounded Output
To Pin
8 of V5
YEL-WH
VI
BLK
VI-WH
YEL
GRN-WH
GRN
BRN-WH
BRN
16Ω
8Ω
4Ω
Comm.
GND
To Pin
8 of V6
BLK-WH
RED
BLUE
WH
BLK-WH
OUTPUT
SOCKET
To Pin
4 of V6
To L2
To Junction
R31, R32
To Junction
R9, C6


To Junction R32, C8
T2
To Pin
8 of V5
To Pin
8 of V6
YEL
VI
BLK
YEL-WH
WH
BLK-WH
GRN-WH
To L2
BLUE
RED
To R30
BLUE-WH
GRN
BRN
WH
BRN
OUTPUT
SOCKET
To Junction
R33, R37
Disconnect Jumper For
Ungrounded Output
GND
COM
4Ω
8Ω
16Ω

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 376

PHILCO MODELS F3035B, F3035SA, F3035SS, UF3035B, UF3035SA, UF3035SS (Ch. 8H20, U, 8H22)

Philco Models E3032I, E3032R, E3034, E3034B, E3034SA, E3034SS, UE3032I, UE3032R, UE3034, UE3034B, UE3034SA and UE3034SS (Ch. 7H20, U, 7H22) were covered in Photofact Folder 3 – Set 376.

Models F3035B, F3035SA, F3035SS, UF3035B, UF3035SA, UF3035SS (Ch. 8H20, U, 8H22) are electrically identical to the models covered except for the following changes.

COMPONENT CHANGES

A 3.3 microhenry choke is added from L19 to C41 (Part #32-4422-10).

R19 is decreased from 1.8meg to 820K.

V12, Horizontal Output, is changed from 12DQ6 to 12DQ6A.

R60 is decreased from 68K to 65K.

R54 is increased from 470K to 500K.

An 850K $\frac{1}{2}$ W resistor is added from R3B to R65.

C2A is decreased from 140mfd to 100mfd.

K4, Horizontal Multivibrator Plate, is changed to Part #30-6025-1.

T4, Audio Output Transformer, is changed to Part #32-8674.

T1, Vertical Output Transformer, is changed to Part #32-8814-2.

R3A, Vertical Hold, is increased from 50K to 60K (Part #33-5592-2).

R2B, Vertical Linearity, is increased from 1meg to 1.5meg (Part #33-5592-2).

R4A, Horizontal Oscillator Auxiliary, is increased from 250K to 260K (Part #33-5572-37).

C50 is decreased from 10000mmf to 8200mmf.

Ch. 8H20U

SELENIUM RECTIFIER CHANGED

Models using Ch. 8H20U use 350ma Selenium Rectifiers (M1, M2), Part #34-8036-3.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 343

TRUETONE MODELS D3614B, D3714A

Truetone Model D3614A was covered in Photofact Folder 14 — Set 343.

Models D3614B and D3714A are electrically identical to the model covered, except for the following changes.

COMPONENT CHANGES

X1, Converter, is changed from CK-760 to 2N140.

X2, IF Amplifier, is changed from CK-760 to 2N139.

X3, AF Amplifier, is changed from 2N132 to 2N109.

X4, Output, is changed from 2N138 to 2N109.

C11 is decreased from 15mmf to 12mmf.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 335

TRAV-LER MODELS 621-74-8, 621-74-8A, 621-75-9 (Ch. 627-26)

Trav-Ler Models 617-73, 621-74, 621-75, 621-76 (Ch. 627-16) were covered in Photofact Folder 14 — Set 335.

Models 621-74-8, 621-74-8A, 621-75-9 (Ch. 627-26) are electrically identical to the models covered, except for the following changes.

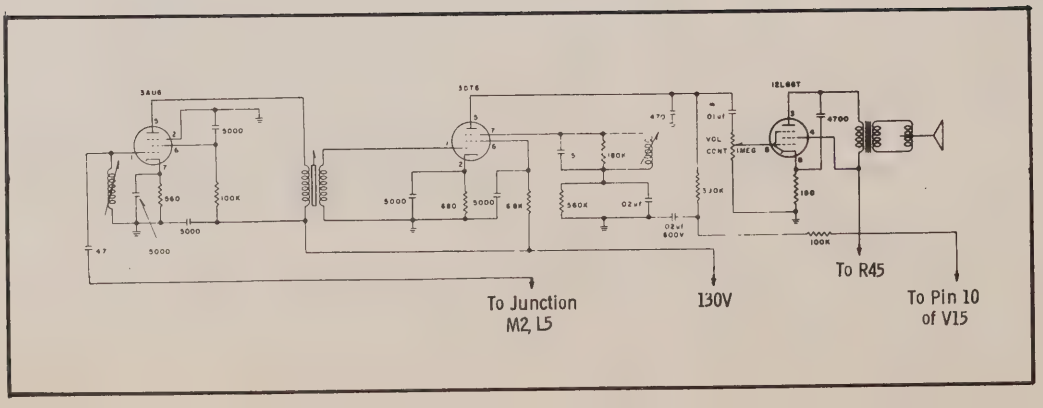
SOUND CIRCUIT CHANGED

The sound section for the new models has been changed. A partial schematic showing the new circuit is given in this bulletin.

MODELS
621-74-8
621-74-8A

PICTURE TUBE CHANGED

V15 (Picture Tube) is changed from 21AWP4A to 21YP4A.


3AU6
5000
560
100K
5000
47
5000
3DT6
5000
680
5000
68K
470
180K
360K
02µf
02µf
600V
01µf
VOL
CONT
1MEG
12L6GT
4700
150
100K
330K
To R45
To Junction
M2, L5
130V
To Pin 10
of V15

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BELL & HOWELL MODELS 770, 775G-1, 775G-10

BELL & HOWELL MODELS 770, 775G-1, 775G-10

BELL & HOWELL MODELS 770, 775G-1, 775G-10

GENERAL INFORMATION

This manual covers the maintenance and repair of Models 770, 775G-1 and 775G-10 recorders. All three recorders have essentially the same transport mechanism, amplifier and speakers.

The Models 775G-1 and 775G-10 are mounted in combination metal and reinforced plastic cases, and have such features as dual recording level lamps, pause control, odometer type program indicator and speaker monitor switch.

The Model 770 recorder is mounted in a leatherette covered wooden case and is equipped with a single recording level lamp. The pause control, program indicator and speaker monitor switch are omitted.

The Model 775G-1 recorder is equipped with a combination erase-play-record head, that will be referred to as a Shure Brothers Head. The Model 770 and 775G-10 (Serial Number above 2702) recorders are equipped with separate erase heads and play-record heads that will be referred to as Bell & Howell heads. These are mounted in a tape guide block and can be individually removed or adjusted. Circuit and component changes, resulting from the change in heads, are set forth in the schematic diagram and parts list.

These recorders are designed to operate 60 cycle, 115 Volts, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Manufactured by:

Bell & Howell Co.
7125 N. Kimball Ave
Chicago 45, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

C354

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SET 403 FOLDER 6

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SPECIFICATIONS

Power Requirements - - - - 117V., 60 Cycle A C

Power Consumption - - - - 90 Watts.

Reel Size - - - - 7" Maximum.

Track - - - - Dual.

Track Selection - - - - Manual Turnover.

Tape Loading - - - - Drop-In-Slot Type.

Tape Speeds:
Play-Record - - - - 7 1/2 and 3 3/4 I.P.S.
Fast Forward - - - - 1200 Feet In 80 Sec.
Fast Rewind - - - - 1200 Feet In 80 Sec.

Overall Frequency Response:
(Play-Record at 7 1/2 IP.S.) - - - - ± 4db, 50 - 13000 c.p.s.

Bias And Erase Frequency - - - - 42 to 46 kc.

Distortion - - - - Less than 5% total over-all distortion at normal levels.

Power Output (Max.) - - - - 5 Watts.

Wow and Flutter: (At 7 1/2 I.P.S.) - - - - Less than 0.25%.

Audio Inputs - - - - Microphone, Radio, Phono, or T.V.

Audio Outputs - - - - Internal or External Speaker.

Recording Lever Indicator - - - - Two Neon Lamps. (Model 770 - - One Neon Lamp).

Tube Complement - - - - 12AX7, 12AT7, 6CM6, 6S4A, & 6X4.

Setting-Up The Recorder - MODELS 775

Open the recorder lid by pressing the gray buttons located on either end of the carrying handle. Remove the power cord from the rear storage section of the recorder and plug it into a conventional 115 volt, 60-cycle, alternating current (AC) outlet.

Loading The Tape

This recorder will accept reels of tape up to 7" in diameter. Before attempting to load the recorder, depress the "Stop" button (red button at upper left side of control panel). Place the empty reel on the right hand spindle and the full reel on the left hand spindle. The full reel should be mounted so that it will rotate counterclockwise as the tape is unwound. Unwind about two feet of tape and lead it through the loading slot. Slip the end into one of the slots in the empty reel. Be sure that the tape is not twisted and that the empty reel will fill as it rotates in a counterclockwise direction. Turn the reel by hand to take up the slack.

Preparing To Record

Tape may be recorded either through the microphone or Radio-Phono cord, both of which plug into the "Input" jack. The microphone is used to make live recordings, or it may be placed in front of the speaker of a radio, phonograph, or television set. The Radio-Phono cord may be connected directly to the speaker terminals of a radio, phonograph, or television set, thus eliminating extraneous background noises which are sometimes picked up by a microphone.

The microphone should be plugged into the INPUT jack on the lower right side of the control panel. Turn the MONITOR switch on the left-hand corner of the control panel to "NORMAL" position. This will disconnect the speakers and prevent squeal from acoustical feed back.

Changing Speeds

The record or playback speed of the recorder may be set to either 3 3/4 or 7 1/2 inches per second. The faster speed provides higher fidelity for recording musical selections, while the slower speed has the advantage of longer continuous programming. To change speeds move the SPEED CHANGE shaft up or down; up for 3 3/4" per second, down for 7 1/2" per second. Before setting the shaft make sure the STOP button is depressed. Operation of the recorder is the same for either speed except for the setting of the SPEED CHANGE shaft.

Volume Control

The recorder is turned on by rotation of the VOLUME control in a clockwise direction. The first few degrees of rotation operate the on-off switch; further rotation increases the volume. The TONE CONTROL is not involved during recording but TONAL balance is properly pre-set in the recording.

Before starting to record, allow about one minute for tube warm up. Press the RECORD button down, hold it there, and press the PLAY button to lock it in place. This two-step operation prevents accidental erasure of previous recordings.

Setting Record Level - MODELS 775

The recording level is monitored by the twin Record-Level indicator lamps. Adjust the VOLUME control knob so that the NORMAL indicator flashes regularly in step with variations of the recorded sound level and the MAX. LEVEL indicator flashes intermittently for peak variations. The level is too high if both indicators flash almost continuously and too low if neither one flashes.

Model 770 has a single "record-level" lamp that should flash during all but the lowest passages.

Pause Lever — Models 775

The PAUSE lever, immediately to the right of the RECORD button, can be used to temporarily halt the travel of the tape without disturbing the settings of other controls. This permits recording or playback to be interrupted without the "click" which would develop if the machine were halted by pressing the STOP button.

The PAUSE lever is operated by sliding it to the left and holding it there for any desired interval. When released, it slides back into position, and recording or playback proceeds as before. The PAUSE lever can be useful in obtaining the proper volume level prior to the actual recording. First turn the VOLUME dial counterclockwise to lowest level. Depress the RECORD and PLAY buttons, then hold the PAUSE lever to the left. Adjust the VOLUME dial for proper indication by the Record-Level indicators, then release the PAUSE lever.

Erasing

The recording process automatically erases any previous material recorded on that track of the tape. To completely erase a recorded track, remove all input connections from the recorder, reduce volume to lowest level, and run the tape through in RECORD mode.

Dual-Track System

The Bell & Howell Models 770 and 775 are dual track recorders. To record on the second half of the tape, turn the full reel over and place it on the left spindle, after moving the empty reel to the right. Rethread the tape and proceed as before.

Using The Radio-Phono Cord

To record directly from the speaker of a radio, phonograph, or television receiver, use the Radio-Phono cord. Insert the plug on the Radio-Phono cord into the INPUT socket on the lower right side of the control panel. Connect the two alligator clips on the opposite end of the cord to the speaker terminals.

When the Radio-Phono cord is used, the program being recorded can be monitored if the monitor switch is moved to the "Monitor" position.

Tone Control

The TONE control knob is located directly to the left of the VOLUME knob. Rotation of the knob in a clockwise direction emphasizes the low frequencies and subdues the high frequencies. Rotation in a counterclockwise direction emphasizes the high frequencies and subdues the low frequencies. No change in volume is produced by a change in setting of the TONE control.

Rewind And Fast Forward

When a tape has been completely played or recorded, press the STOP button to stop the recorder (the STOP button can be used at anytime during any mode of operation). To return the tape back to the original supply reel, press the REWIND button, then use the STOP button when the tape is completely rewound. For rapid advance of the tape in a forward direction, press the FORWARD button. When either the FORWARD or REWIND buttons are pressed the tape travels at approximately 180 inches per second. Be sure to take up any slack in the tape before using either of these fast speeds.

The recorder is designed so that the STOP button must be pressed before changing from one mode of operation to another. Thus to go from FORWARD or REWIND to another function the machine must first come to a complete stop. This feature protects the tape from damage.

Program Indicator — Models 775

This feature is useful in "logging" material as it is recorded or in relocating previously logged material. The indicator should be set to "000" at the start of a reel of tape, then any desired point on the tape can be logged or relocated. The counter adds when the tape travels in a forward direction and subtracts for the reverse direction, as during rewind.

Public Address

The Bell & Howell Model 775G tape recorder can be used as a public-address unit in the following manner. Plug the microphone into the front panel INPUT jack and turn the power on. Remove all tape from the recorder. Set the MONITOR switch at the "P.A." position. Press the RECORD button and lock it in place by pressing the PLAY button.

Keep the microphone to one side or behind the speakers to avoid feed-back squeal.

Dictation And Transcription Machine

An ear-phone unit is available as an accessory. With its use the recorder will perform as a dictation and transcription machine, limiting the sound to one person.

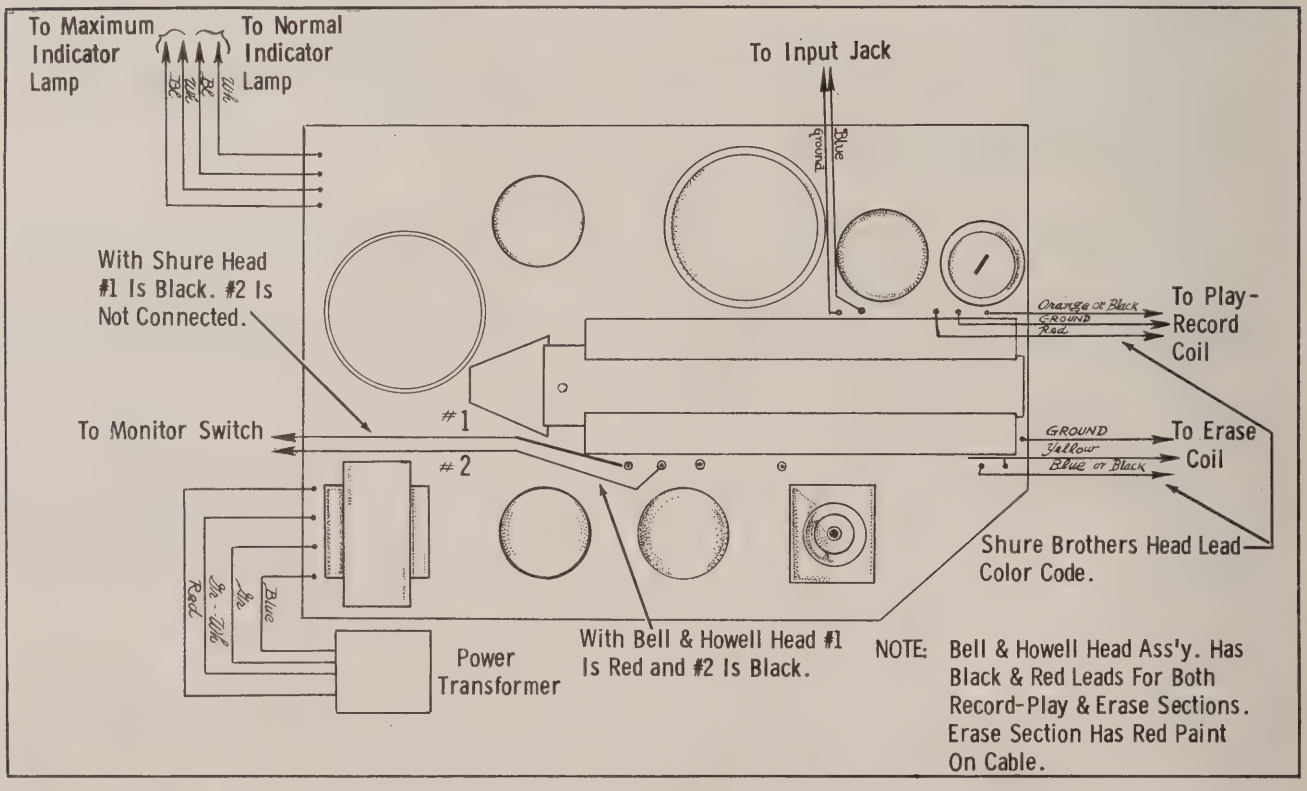

To Maximum Indicator Lamp
To Normal Indicator Lamp
To Input Jack
With Shure Head #1 Is Black. #2 Is Not Connected.
To Play-Record Coil
To Monitor Switch
#1
#2
To Erase Coil
Shure Brothers Head Lead Color Code.
Power Transformer
With Bell & Howell Head #1 Is Red and #2 Is Black.
NOTE: Bell & Howell Head Ass'y. Has Black & Red Leads For Both Record-Play & Erase Sections. Erase Section Has Red Paint On Cable.

FIGURE 1.

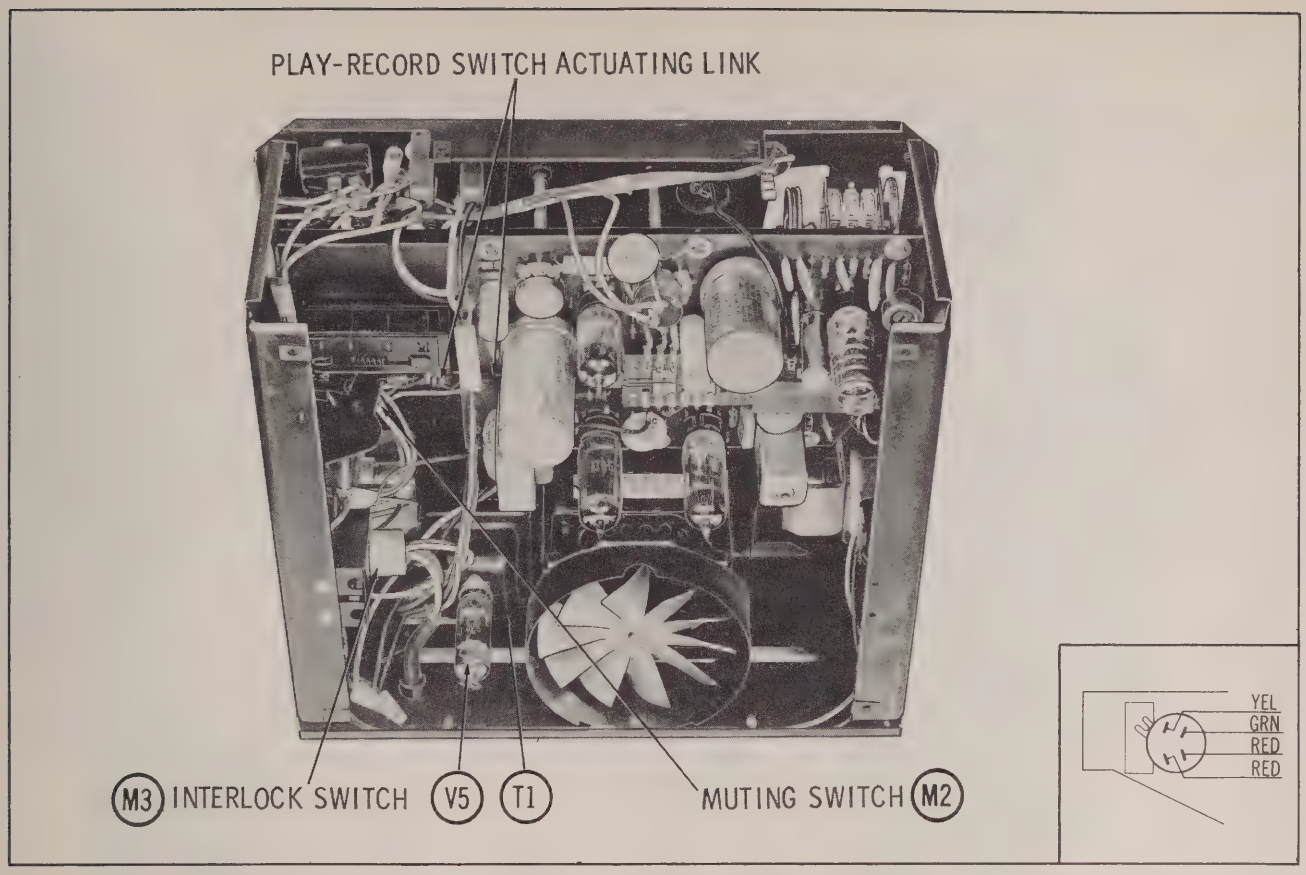


FIGURE 2

DISASSEMBLY INSTRUCTIONS

To Test Or Replace Tubes

Remove the bottom grille assembly, held in place by 4 Phillips head screws. The two longer screws are used for that side of the grille which has the name plate.

To Remove Amplifier And Tape Mechanism From Case

1. Remove the two reel spindles held in place by Phillips head machine screws and flat washers.

2. Remove PAUSE, VOLUME, and TONE control knobs from their shafts.

3. Remove the top plate assembly (5) secured in place by 4 Phillips head machine screws. This will give access to the magnetic head, pressure pad assembly, idler drive wheels, upper linkage parts, Veeder Root counter assembly, and level indicating lamps.

4. Remove the plastic carrying handle, secured in place by two screws. On early models, screws are accessible from under side of the handle.

5. Place the recorder in its upright position and remove the two plastic feet, secured in place by the Phillips head machine screws at the back of the case. Remove the bottom grille as described under TO TEST OR REPLACE TUBES.

6. Remove the two Phillips head screws accessible through the openings in the channel metal support for the plastic handle.

7. Withdraw the mechanism assembly from the case, being careful not to damage the speaker cones.

Removal Of Amplifier Assembly

1. Disconnect all plug-in leads shown in Fig. 1.

NOTE: Refer to Figure 2 for location of items mentioned below.

2. Disconnect the slide switch wire link from the slide switch by first loosening the 3/8" switch position adjustment nut.

3. Unsolder the leads to the on-off switch and the interlock muting switch (M2 Fig. 2).

4. Unscrew the volume and tone control locking nuts.

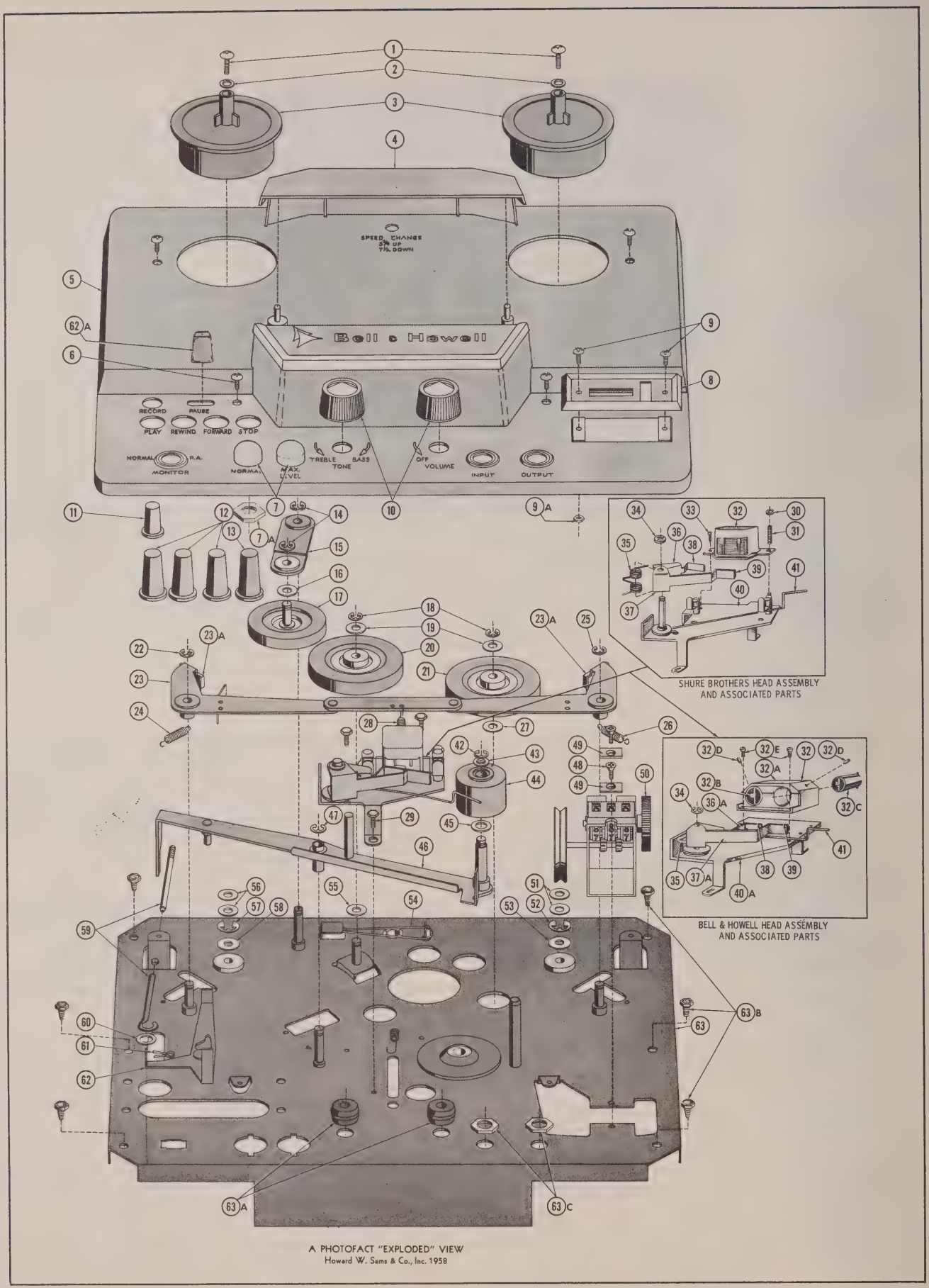


FIG. 3A. EXPLODED VIEW OF PARTS ABOVE MECHANISM PLATE.

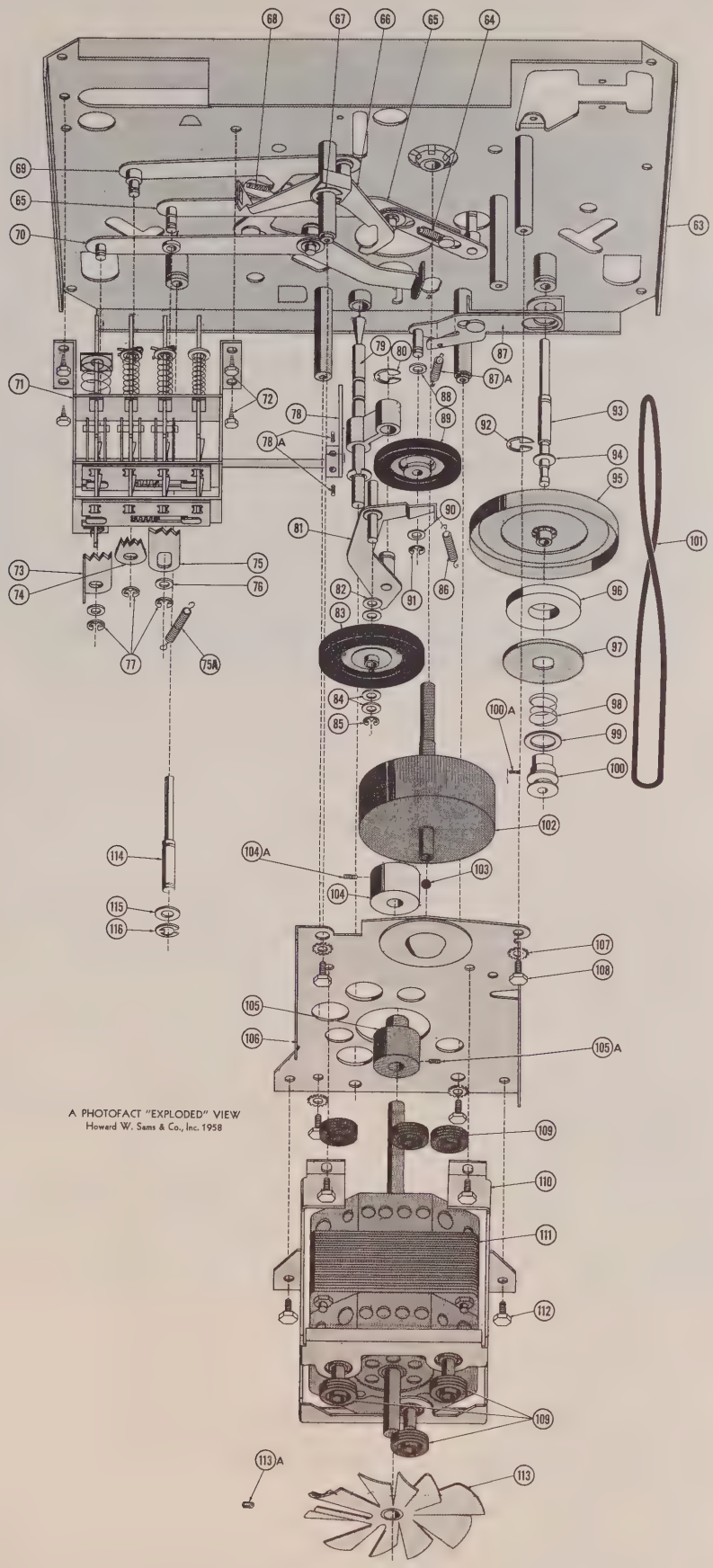


FIG. 3B. EXPLODED VIEW OF PARTS BELOW MECHANISM PLATE.

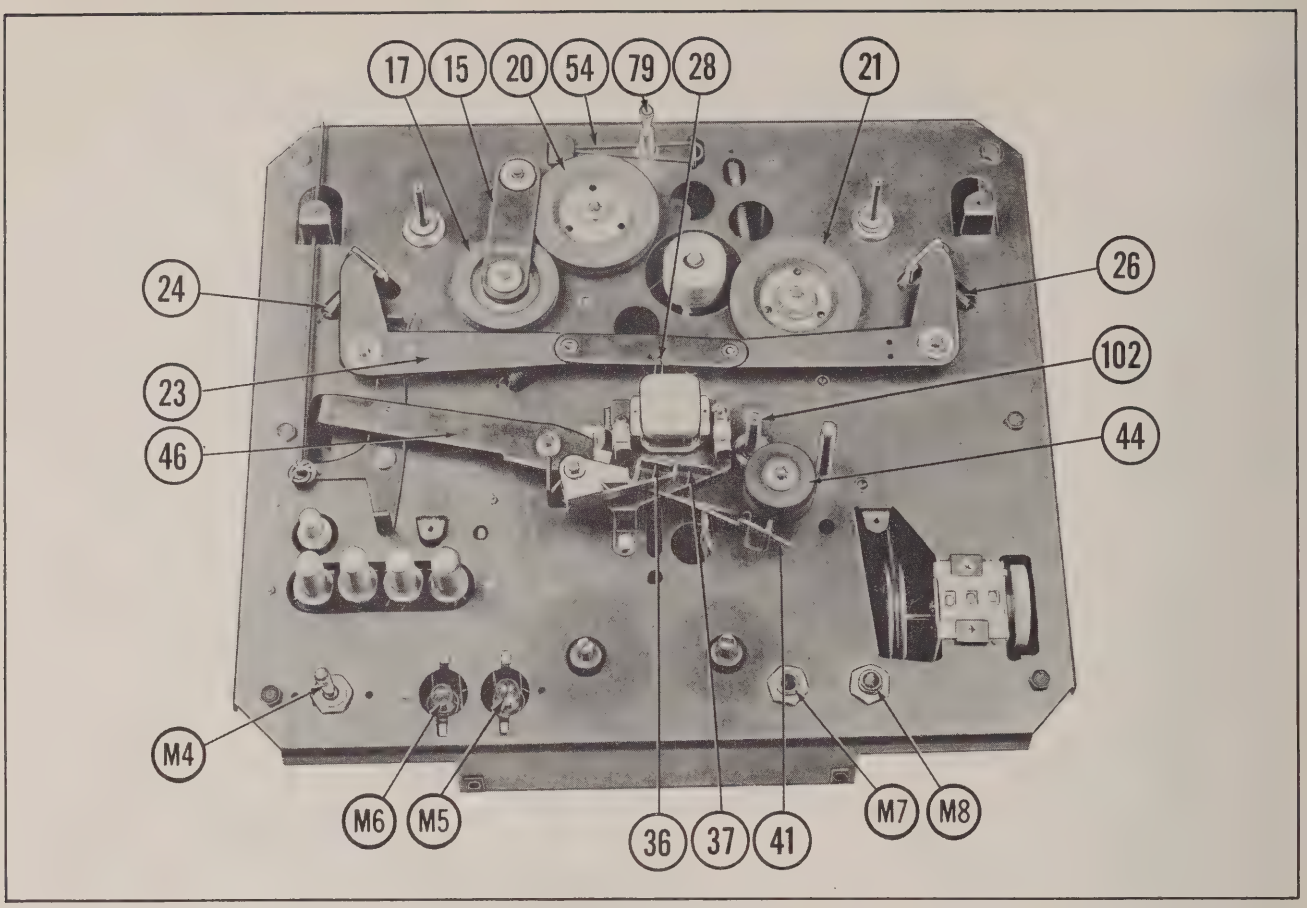


FIGURE 4

5. Remove the six 1/4" self tapping screws and flat washers along the bottom and top edge of the printed circuit board.

6. Withdraw the amplifier assembly, using care not to damage the printed circuit board.

NOTE: After reassembly adjust the slide switch position and secure the adjustment with the 3/8" nut so that the slide switch makes proper contacts when changing from record to play back position.

Removal Of Mechanism Plate Assembly

1. Disconnect the drive motor (111) leads by removal of the solderless connectors.

2. Remove the input, output jack and monitor switch locking nuts which hold these components to the main mechanism plate.

3. Remove the two indicator lamp assemblies from the main mechanism plate.

4. Disconnect the two cables of the magnetic head assembly from the amplifier and free these cables from their cable clamps.

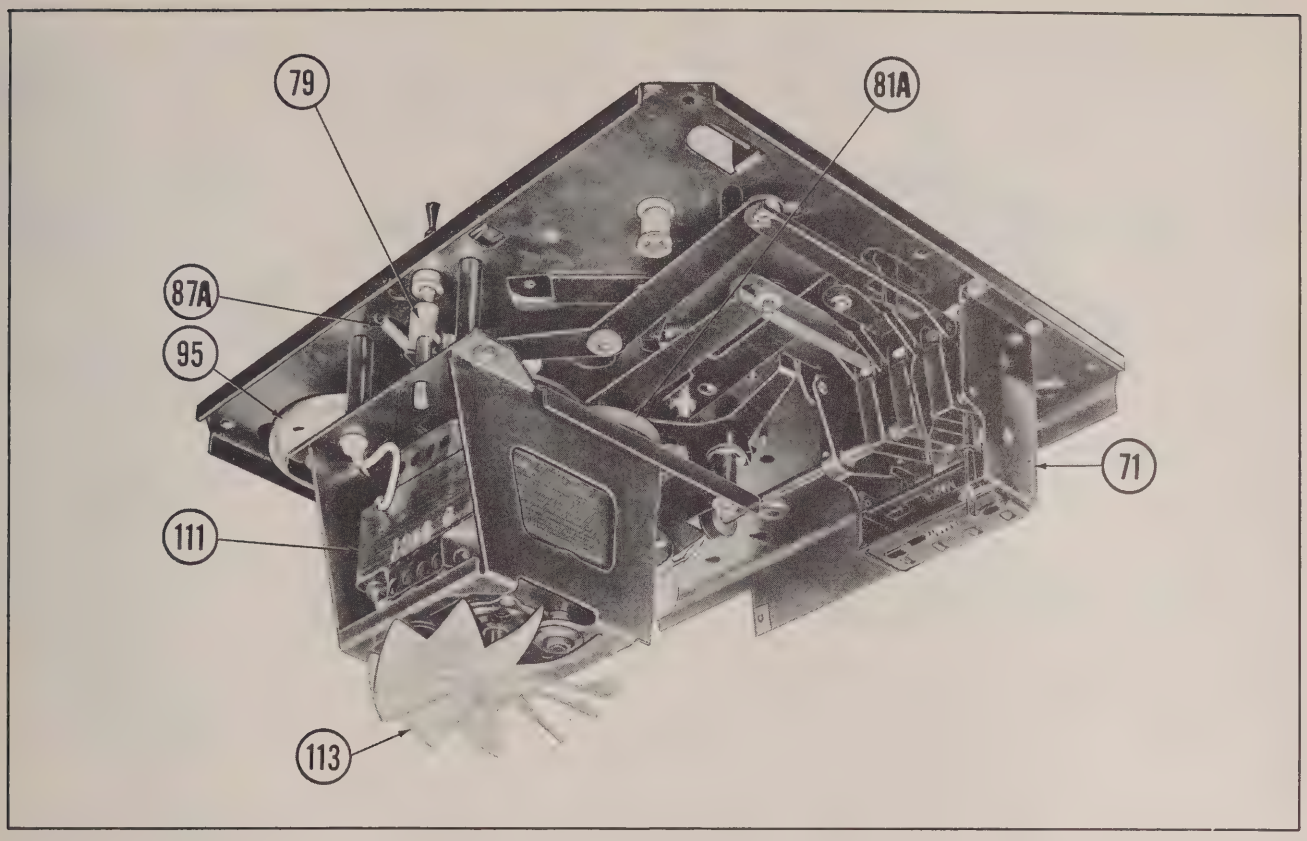
5. Remove the six 5/16" self tapping screws that hold the main mechanism plate to each speaker mounting plate. The main mechanism plate can now be withdrawn, and the drive motor, clutch assembly, and push button control switches from the linkage system may be inspected, cleaned, and adjusted if necessary.

INSTRUCTIONS FOR OPERATING THE RECORDER WITHOUT CASE WHILE SERVICING

In order to operate the unit when removed from the case it is necessary to close the interlock switch. Use a wedge to hold the switch in a closed position. Be sure to restore the interlock to normal condition before reassembling the recorder.

The speaker cones should be protected by covers of cardboard on masking tape.

The unit should be operated in an upright position or otherwise supported in such manner that the ventilating fan is not obstructed during operation.



INTRODUCTION

Troubles that may be encountered are arranged in mechanical and electrical groupings, depending upon origin. Due to the fact that some defects in reproduced sound are actually of mechanical origin, troubles such as "Wow" or "Flutter" and off pitch conditions are listed as mechanical troubles.

Wherever reference is made to the use of lubricants, apply only enough lubricant to coat the moving surfaces. All excess lubricant should be removed.

MECHANICAL TROUBLE CHART

SYMPTOM	POSSIBLE CAUSE	REMEDY
Noisy push button operation.	Lack of lubrication.	Apply Bell & Howell # Spec. 1543 oil (Hodson Gear Oil) to neoprene pads on push button shafts.
Vibration noise emanating from case when in fast forward or rewind position.	Top plate assembly seated improperly.	Remove top plate assembly (5 Fig. 3A) and bend the front end of top plate down slightly so when secured in place the front edge will seat against the tape recorder bottom case assembly.
Volume or tone controls bind and are difficult to turn.	Printed circuit assembly not centered.	Reposition assembly, align shafts into rubber grommets.
	Lack of lubrication or "tacky" condition of rubber grommets.	Check condition of rubber grommets where tone and volume control shafts pass through main mechanism plate. Lubricate rubber grommets with DOW-Corning 200-350CS fluid silicon grease.
Clicking noise when recorder is in fast forward or rewind.	Damaged Veeder Root counter.	Check Veeder Root counter for loose springs or lack of lubrication. If necessary, lubricate gear teeth with DOW-Corning 200-350CS fluid silicon grease.

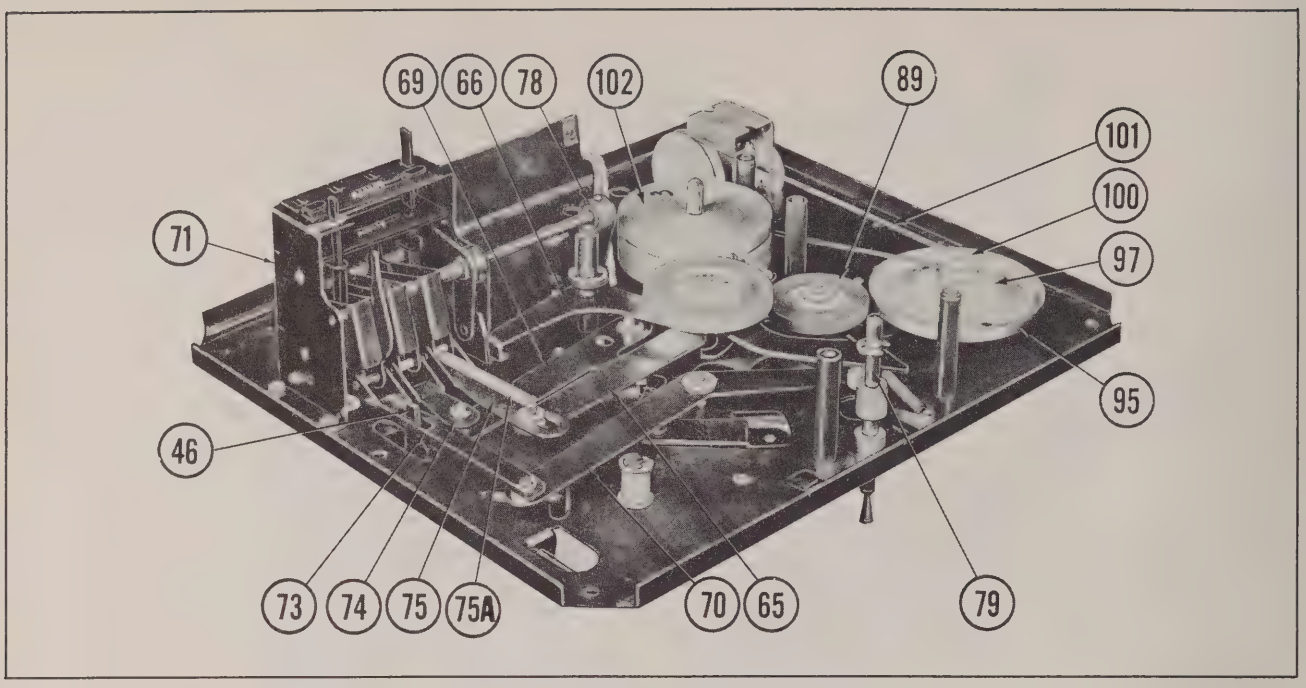


FIGURE 6

MECHANICAL TROUBLE CHART (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
Case upper lid assembly will not lock properly.	Alignment of locking prongs incorrect.	Bend the two locking prongs riveted to the upper lid assembly approximately ten degrees inward and to the right or left as required to make proper contact with the lock catches in the lower case assembly.
Speed change shaft binding.	Lack of lubrication.	Apply lubricant, Bell & Howell Spec. #1544 (Hodson non-melting white lubricant) to speed change shaft.
Drive erratic on both speeds.	Position of drive pulley (105 Fig. 3-B) incorrect.	Check position of drive pulley on drive motor. Loosen Allen screw and position bottom of drive pulley to distance of .218 to top of motor shell.
Thumping or scraping noise when in forward or rewind position.	Position of forward and rewind pulley (104 Fig. 3-B) incorrect.	If position of forward and rewind pulley is too high on its shaft, it will scrape the underside of the top plate assembly; if position of pulley is too low, the Allen screw opening in the pulley will strike against the rubber molded wheel. Readjust as necessary.
Take up reel doesn't revolve in play or record position.	Take-up idler spring (87A Fig. 3-B) off or broken.	Replace.
	Oil on take up idler rim (95 Fig. 6).	Moisten cloth in alcohol and clean surface of rubber rim.
	Clutch slipping on clutch wheel assembly.	Reposition clutch pulley (100 Fig. 6) on shaft and tighten Allen screw.
Take up reel does not revolve in fast forward position.	Oil on rim of fast forward idler wheel (21 Fig. 4).	Moisten cloth in alcohol and clean surface of rubber rim.
	Fast forward lever spring (75A Fig. 6) off or broken.	Replace.

MECHANICAL TROUBLE CHART (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
	Fast forward idler spring (64 Fig. 3-B) off or broken.	Replace.
Supply reel does not revolve in rewind position.	Oil on rewind idler wheel (17 Fig. 4) or rewind drive wheel (20).	Moisten cloth in alcohol and clean surfaces of rubber rims of (17) and (20).
	Rewind idler spring (68 Fig. 3-B) off or broken.	Replace.
Reels do not stop when stop button is depressed.	Brake actuating spring (28 Fig. 3-A) off or broken.	Replace.
	Brake lining worn.	Replace. (See Adjustments & Tests.)
	Brake lever (78 Fig. 6) loose on shaft.	Reposition brake lever (78) and tighten Allen screws.
Counter mechanism does not operate.	Defective counter (50 Fig. 3-A).	Check gear teeth in counter for damage. Replace if necessary.
	Counter belt (101 Fig. 7) off or broken.	Replace.
Wow; flutter or chirps.	Improper pressure between capstan (102 Fig. 4) and pressure roller (44).	See Adjustments & Tests.
	Excessive takeup tension.	See Adjustments & Tests.
	Counter (50 Fig. 7) binding.	Check for chips or dirt in gears and for scored shaft. Clean and lubricate. Use Dow-Corning 200-350CS fluid silicon grease.
	Dirty pressure pads (38 Fig. 3A)	Saturate with alcohol. Brush contact surfaces in direction of normal tape travel.
	Pressure roller (44 Fig. 3A) binding on shaft or damaged.	Remove roller and clean bearing with pipe cleaner dampened with alcohol. Clean roller stud, if scored, polish with crocus cloth. Apply a light coating of Hodson 2-478 non-melting grease to the stud before reassembling.
	Scored flywheel shaft (102 Fig. 4) or flywheel shaft bearings.	If shaft is only lightly scored, polish with crocus cloth. WARNING: DO NOT USE EMORY CLOTH. If bearings are scored, drill out rivets, remove bearings and replace them.
	Worn idler wheel assembly (83 Fig. 3-B).	Some dents in the driving surface can be ironed out by pressing the flat side of a screw driver blade against the tire, while the wheel is revolving. If tire is nicked or torn, replace the wheel assembly. Apply a light coating of Hodson 2-478 non-melting grease to the stud, before reassembling.
	Bent fan blades (113 Fig. 5) or bent motor shaft.	Place fan (hub up) on a flat surface. The ends of all blades should contact the surface. If any blades are out of alignment by more than 0.015", reshape those blades. If motor shaft is bent, replace the motor.
Pitch of sound, from prerecorded tape is low.	Capstan drive mechanism is slipping.	Remove top panel (5 Fig. 3A). Dampen a pipe cleaner with alcohol and clean all driving surfaces. NOTE: All driving surfaces can be reached thru holes in the mechanism plate

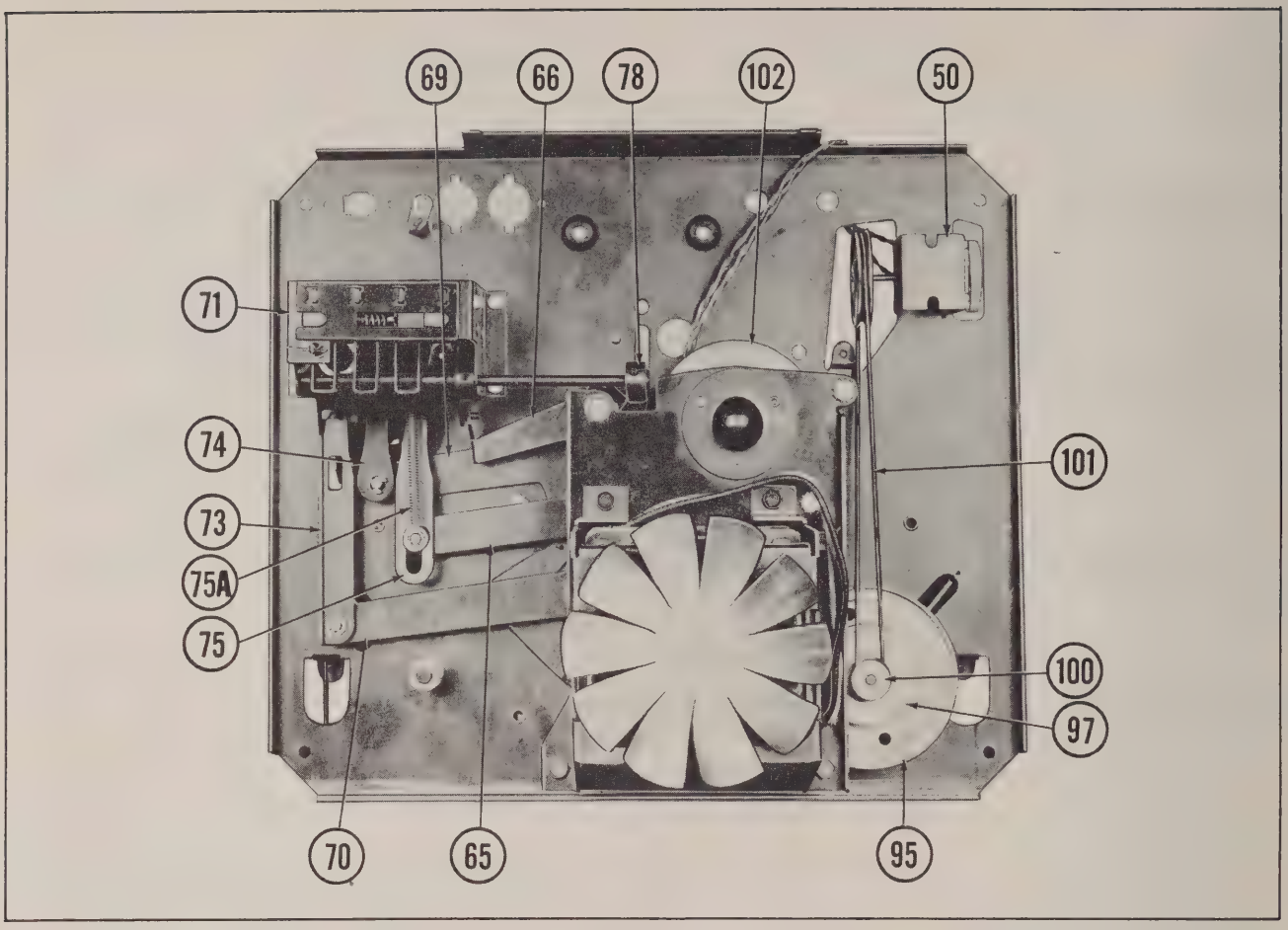


FIGURE 7

MECHANICAL TROUBLE CHART (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
		(63 Fig. 3B). CAUTION: KEEP FINGERS OUT OF ROTATING PARTS.
Loss of high frequencies (Record and playback).	Pressure pads (38 & 39 Fig. 3A) loose or worn.	Check spring tension of pressure pad spring Replace worn pads (see Replacement of Pressure Pads in Adjustments & Tests Section).
	Foreign material collected in tape guide channel.	Remove caked material with wooden or soft plastic probe. Wipe channel with pipe cleaner or cloth dampened with alcohol.
Loss of high frequencies from previously recorded tape.	Azimuth adjustment of head is incorrect.	See Adjustments & Tests.
Rattles.		Use damping fluid.

ELECTRICAL TROUBLE CHART

SYMPTOM	POSSIBLE CAUSE	REMEDY
Recording lamps fail to indicate.	Defective neon lamp. (M5 or M6).	Replace.
	Red lead of muting switch (M2) shorted to ground. Neon lamp socket shorted to ground.	Check circuits with ohm meter.

ELECTRICAL TROUBLE CHART (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
	Cold solder connection to record-play-back switch (M1).	Reheat solder connection.
Motorboating.	12AX7 tube defective or not fully seated in socket.	Check and replace as necessary.
Right speaker dead.	Left speaker lead shorted to ground.	Make visual check.
Distortion.	Black lead of speaker harness loose.	Make visual check.
	Defective 12AT7 or 6CM6 tube.	Test and replace if necessary.
	Defective record level neon lamp.	Test and replace if necessary.
	Hum control (R3) center rotating section shorted to ground. Resistance of center section to ground should be 270 ohms.	Check with ohm meter.
	Resistor R16 (22K ohm in plate circuit of 12AT7) open.	Check with ohmmeter.
Low Output.	Recording level too low.	See Power Output test under Adjustments & Tests. Check microphone.
	Record current too low.	See Adjustments & Tests.
	Foreign material on tape guide or head.	Remove.
	Worn head pads or insufficient pressure.	See "Loss of High Frequencies".
Low Output and Distortion.	No bias or low bias.	Oscillator coil open. Shorted erase head. Record-Play switch (M-1) not functioning. Check bias. (See Adjustments & Tests).
	Foreign material on tape guide or head.	Remove.
Poor low frequency response.	Defective magnetic head assembly.	Replace.
Low sound output.	Tone control (R2) shorted to ground at the capacitor network C12 and C13	Check with ohmmeter.
6X4 rectifier plates red hot.	Red B leads of power transformer shorted to ground.	Check with ohmmeter.
	B+ filter capacitor shorted.	Check sections A and B of filter capacitor C1 and replace if necessary.
Hum.	Open hum adjusting control (R3).	Replace.
	Printed circuit wiring from output transformer frame to filter capacitor open.	Check with ohmmeter.
	Cold solder connection of capacitor C4, .1 mfd (in input circuit).	Reheat the solder connections.
	Cold solder connection of output transformer frame.	Reheat the solder connection.
	Cold solder connection of rectifier tube retaining spring where attached to power transformer shell.	Reheat the solder connection.

ELECTRICAL TROUBLE CHART (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
	Defective tubes.	Check and replace as necessary.
	12AX7 tube shield missing or not making firm contact against ground lip.	Replace shield; bend lip to make firm contact.
	AC line cord polarity.	Reverse polarity of AC line cord in wall receptacle to obtain minimum hum.
	Condition and/or position of felt erase pad improper.	The top of the felt pad must pass just beneath the magnetic head shield front edge cut out. If frayed, the felt pad should be replaced.
Internal or external speakers do not operate.	Defective monitor switch (M4).	Check with ohmmeter.
	Defective muting switch (M2).	Check with ohmmeter.
Excessive hiss in record and playback.	Noisy 12AX7 and/or 12AT7.	Substitute new tubes and test for noise.
	Magnetized Record-playback head.	Use head demagnetizer on head. (Note: it is considered good practice to demagnetize heads after each 10 or 20 hours of use.)
Plays back prerecorded material but will not record.	Defective 6S4A tube.	Test and replace if necessary.
	Defective oscillator coil (L1).	Test and replace if necessary.

ADJUSTMENTS AND TESTS

Interlock Adjustments

The interlock switch is a DPDT spring loaded switch, which opens the AC input line when the bottom grille assembly is removed from the case. If this switch fails to operate properly it may be due to poor lead contact connections or to mechanical reasons.

The switch should close when the bottom grille is secured in place. If it fails to do so, check the height of the switch arm which operates the interlock. The end of this arm should be from 7/8" to 1" above the grille assembly for proper switch operation.

Improper Tracking Of Tape Reels

The feed and take-up plastic reel spindles are identical and are held in place with Phillips head screws and flat washers. The reel spindles are mounted on a flanged shaft. If the plastic reel spindles wear and the tape scrapes on the reels, shim washers can be added between reel and flange shaft until the reels are in proper alignment. The PLAY button should be depressed whenever the spindles are being replaced in order to prevent damage to the cork brake lining.

Adjustment Of The Recording Case Locking Mechanism

1. Remove the two plastic latch release knobs by pulling them straight out, away from the case.

2. Remove the two Phillips head machine screws visible through the small openings in the metal handle bracket.

3. Drive out the two roll pins that secure the handle bracket to the two spring loaded shafts by the following method:

   a. Place the handle bracket on a firm surface and use a 1/8" hard steel rod to drive out the roll pins. Do not use a pointed rod or the roll pins will spread and be very difficult to remove.

b. Remove the cover from the locking mechanism and inspect the linkage for freedom of movement. If lubrication is required use Bell & Howell Spec. #1544 (Hodson Non-Melting White Lubricant).

Replacement Of Brake Linings

If damage or wear makes it necessary to replace the brake linings, scrape the old lining from the metal surface. Apply Ambroid liquid cement (Mfd. by Ambroid Company, Boston, Mass.) to the metal surfaces and set the new cork linings in place.

Replacement Of Pressure Pads

Worn pressure pads may cause loss of volume and a falling off of higher frequencies. The two pressure pads are identical. To replace, scrape off the old pads and affix the new pads with Ambroid liquid cement.

Pressure Roller Against Capstan

Connect an inch-ounce scale to end of pressure arm assembly (46 Fig. 4). Pull the pressure roller free from the capstan. If reading is less than 16 in.-oz., bend the spring (41) in order to increase pressure.

Take Up Tension Adjustment

Place an empty 7" reel on the take up spindle. Attach a short loop of string to the outside reel edge. Connect a gram scale, Chatillon horizontal type (with a minimum reading of 60 grams) to the string. Hold the scale parallel to the recorder and at right angles to the take up spindle. Depress the "play" button and note the reading. If the reading is over or below the tolerance listed herein, remove the mechanism from the case assembly as described under "Disassembly Instructions".

Next remove the back mechanism plate secured in place by the six Phillips head sheet metal screws. Disengage the counter drive belt from the clutch pulley (100 Fig. 5B). Remove the pulley secured by a 8/36 x 3/16" set screw. The tension spring (98 Fig. 3B) and felt lining (96 Fig. 3B) can now be slipped off the take up spindle (93 Fig. 3B). If the reading was over 60 grams, the felt should be saturated in a solution composed of one part Standard Oil Company (New Jersey) turbine oil #31 and 15 parts carbon tetrachloride. After saturation allow the felt to dry for 30 minutes before reassembly of the clutch. If the reading was less than 30 grams, replace the tension spring and/or felt as required.

After reassembly engage the counter drive belt properly in order that the counter "counts" up when the "play" or "forward" button is depressed.

Recheck the tape recorder for proper operation after service has been completed.

Azimuth Adjustments

Thread recorder with azimuth test tape of 1.0 mil. wavelength. (Available from Toogood Recording Company., 221 N. LaSalle Street, Chicago, Ill.) Turn volume control to "ON". While recorder is warming up, connect an AC voltmeter (0-5 volt range) to a standard phone plug and drop the plug into the "Output" jack. (Do not insert plug all the way into the jack, or the speakers will be disconnected).

Place the speed change shaft (79 Fig. 4) in the 7 1/2 I.P.S. position and proceed as follows:

Shure Head

Start recorder (Play) and adjust volume control to produce a voltmeter reading of approx. 1 volt. Rotate azimuth adjusting screw (33 Fig. 3A) and observe meter reading. Adjust for maximum output.

Bell & Howell Head

Loosen head locking setscrew (32D Fig. 3A). Grasp the fin at the rear of the head with long-nose pliers or tweezers and rotate the head to obtain maximum output. Hold head in position, while tighting the locking setscrew.

Power Output

Make a test recording of a 400 cycle or 1000 cycle tone at the level where the "Distort" lamp flickers very faintly on the Model 775 or where the "Record" lamp flashes strongly on the Model 770. Connect an AC voltmeter, oscilloscope and 6 ohm 5 watt resistor across a standard phone plug and insert plug into the "Output" jack. Depress "Play" button, adjust volume control and observe distortion, note output. Output voltage should be at least 3.5 volts (5% harmonic distortion level).

Signal To Noise Ratio

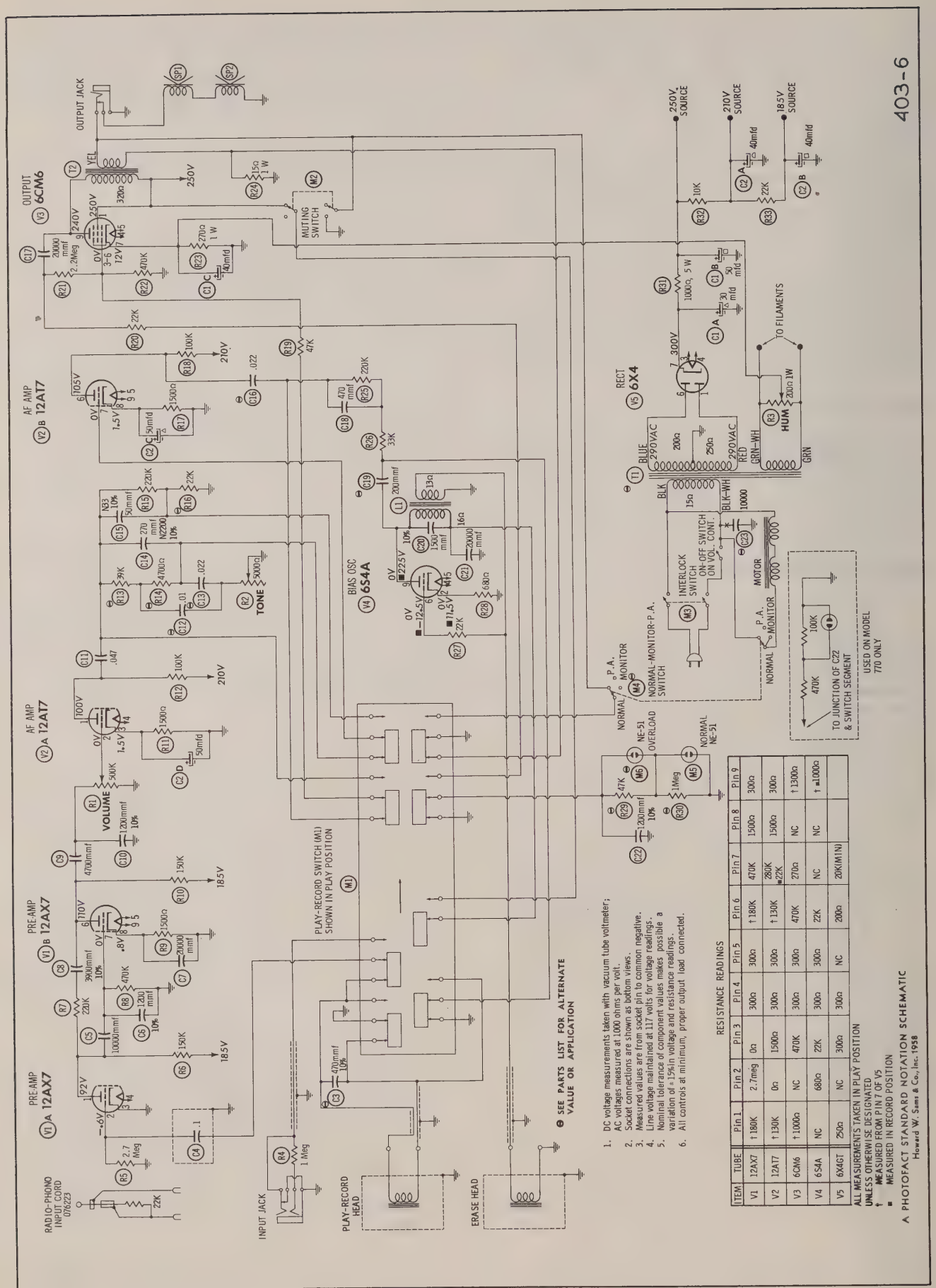
Make a test recording of a 1000 cycle tone at 7 1/2 I.P.S., set oscillator level low enough so that "Volume" control knob can be turned to at least 3/4 open position. Disconnect oscillator and rewind about 1/2 of recorded tape (do not touch volume control). Re-record over last 1/2 of tape without any signal. Rewind all of tape. Connect 6 ohm 5 watt resistor and VTVM across a phone plug and insert plug in "Output" jack. Depress "Play" button and adjust volume control to produce an output of 1 volt. When re-recorded (erased) section of tape reaches head, output should drop at least 36 DB.

Erase And Record Currents

Shure Head

Insert a 10 ohm non-inductive resistor in series with the ground return lead (black or orange) from the record-play head. Connect a V.T.V.M. across the resistor. Depress the "Record" button. Set the volume control at its lowest level and read the bias current. Bias current should produce a voltage reading of 0.011 - 0.016 volts.

Remove 6S4A tube, connect an audio oscillator (set at 1000 C.P.S.) to the input of the recorder and adjust oscillator input so that "Distort" lamp will flash when volume control is 3/4 open.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 180K	2.7meg	0Ω	300Ω	300Ω	† 180K	470K	1500Ω	300Ω
V2	12AT7	† 130K	0Ω	1500Ω	300Ω	300Ω	† 130K	280K ■ 22K	1500Ω	300Ω
V3	6CM6	† 1000Ω	NC	470K	300Ω	300Ω	470K	270Ω	NC	† 1300Ω
V4	6S4A	NC	680Ω	22K	300Ω	300Ω	22K	NC	NC	† ■ 1000Ω
V5	6X4GT	250Ω	NC	300Ω	300Ω	NC	200Ω	20K(M1N)		

ALL MEASUREMENTS TAKEN IN PLAY POSITION
UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 7 OF V5
■ MEASURED IN RECORD POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

SCHEMATIC OF 770, 775G-1 AND 775G-10 AMPLIFIERS.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AT7	
V3	Audio Output	6CM6	
V4	Bias Osc.	6S4A	
V5	Rectifier	6X4GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Bell & Howell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	450	701800						R2684 *
B	■50	350							
C	40	25							
C2A	◆40	300	701681						R2683 *
B	■40	300							
C	▲50	25							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

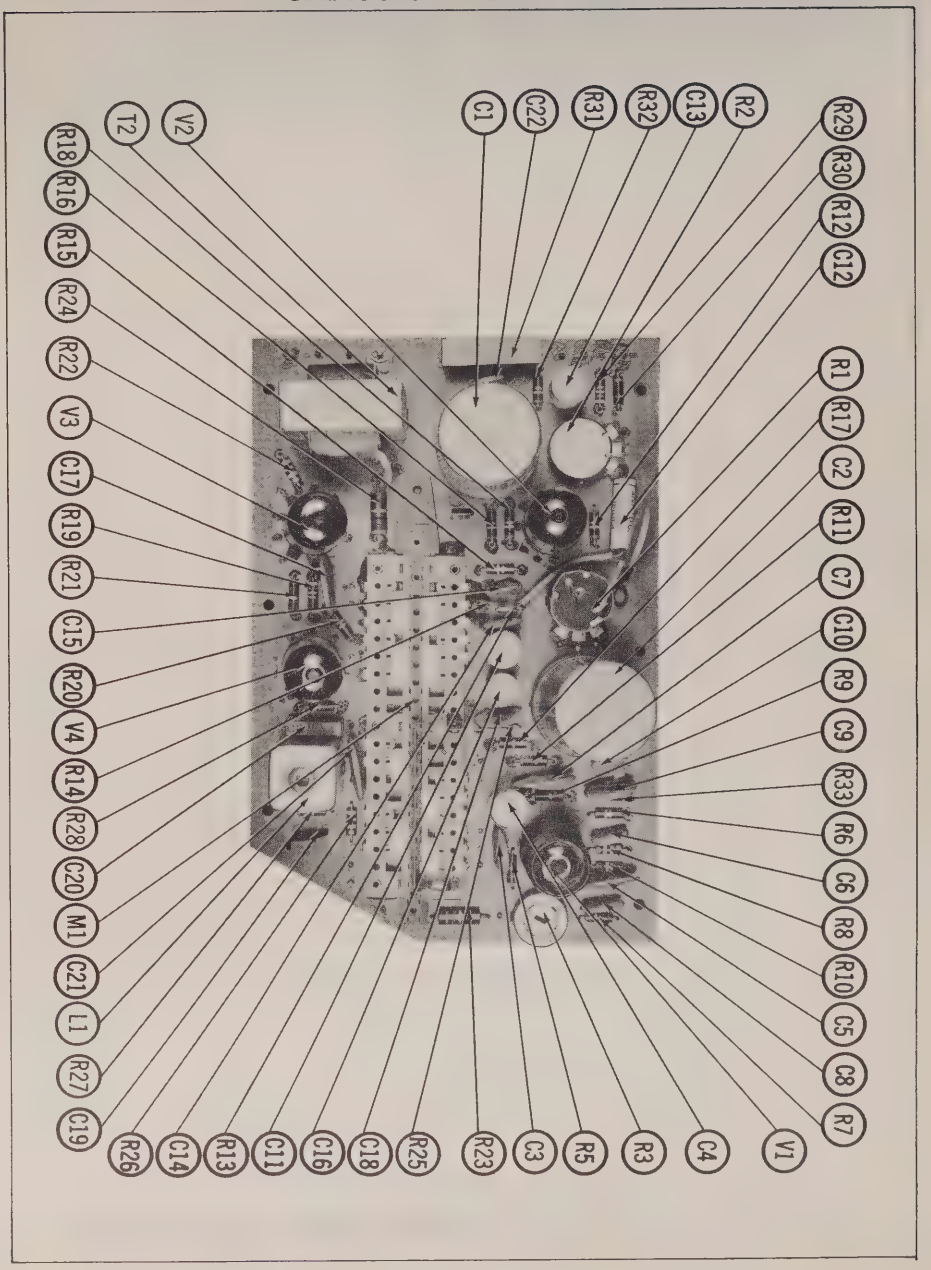
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Bell & Howell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	470		701796		D6-471	5R5T47		MS-347	10% ①
C4	.1	200	701808	P288N-1		BC2P1J	ACE401	2SE-P10	
C5	10000		701793	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	1200		701790			1R5D12		MS-212	10%
C7	20000		701794	BPD-02	DD-203	BYB6S2		5HK-S2	
C8	3900		701791			1R5D39		MS-239	10%
C9	4700		701792	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C10	1200		701790			1R5D12		MS-212	10%
C11	.047	400	701797	P488N-047		BC6S47J	ACE6147	4SE-S47	
C12	.01	200	701694	P288N-01	D6-103	CUB2S1	GEM-211	2TM-S1	②
C13	.022	400	701798	P488N-022		BC6S22J	ACE412	4SE-S22	③
C14	270		701789						10% N2200
C15	50		701788						10% N33
C16	.022	400	701798	P488N-022		BC6S22J	ACE412	4SE-S22	④
C17	20000		701794	BPD-02	DD-203	BYB6S2		5HK-S2	
C18	470		701796						10% N220
C19	200		701802	BPD-0002	DD-201	L10T2	UC-532	5GA-T2	⑤
C20	1500		701799	1464-0015		1R5D15		MS-215	10%
C21	20000		701794	BPD-02	DD-203	BYB6S2		5HK-S2	
C22	1200		701790			1R5D12		MS-212	10%
C23	10000		701793	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	⑥

① Models 775-G-10 and 770 use 270mmf 10% in this application (Part # 701789)
② Not used in Models 775-G-10 and 770.
③ Models 775-G-10 and 770 use .047@400V in this application (Part # 701797)
④ Some versions use .033mfd@400V in this application.
⑤ Models 775-G-10 and 770 use 250mmf 1000V in this application (Part # 800669)
⑥ Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA Bell & Howell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	702008					Volume
B	Switch							
R2	5000Ω	½	702007					Tone
R3	200Ω	1	701849					Hum Adj. Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Bell & Howell PART No.	NOTES
R4	1meg		701829	
R5	2.7meg		701990	
R6	150K		701834	
R7	220K		701819	
R8	470K		701835	
R9	1500Ω		701857	
R10	150K		701834	
R11	1500Ω		701857	
R12	100K		701826	
R13	39K		701983	①
R14	4700		701859	②
R15	220K		701819	
R16	22K		701820	③
R17	1500Ω		701857	
R18	100K		701826	
R19	47K		701838	
R20	22K		701820	
R21	2.2meg		701940	
R22	470K		701835	
R23	270Ω	1	701836	
R24	15Ω	1	701822	
R25	220K		701819	
R26	33K		701840	
R27	22K		701820	
R28	680Ω		701831	
R29	47K		701838	④
R30	1meg		701828	⑤
R31	1000Ω	5	702010	
R32	10K		701832	
R33	22K		701820	

①Not used in Models 775-G-10 and 770
②Models 775-G-10 and 770 use 47K in this application (Part #701838)
③Models 775-G-10 and 770 use 15K in this application (Part #701954)
④Model 770 use 470K in this application (Part #701835)
⑤Model 770 use 100K in this application (Part # 701826)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Bell & Howell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.44A	580VCT @.060A	6.3VAC @1.6A	076221 (777-39)						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Bell & Howell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω	6-8Ω	800566 (777327)	Z10040	A-2900①	AU-608①	A-3850①	24S60①	S-51X①	①Use Original Channel Frame

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Bell & Howell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Bias Osc.	800556				

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Bell & Howell PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	800445 (777-45)	52A1	
SP2	5 1/4"	PM	3-4Ω	800446 (777-47)	52A1	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Bell & Howell PART No.	NOTES
M1	Switch	800448	Record-Playback, Slide Type
M2	Switch	800447	Muting, Rotary Type
M3	Switch	800450	Interlock, Snap Type
M4	Switch	701109	3 Position, Normal-Monitor-Pa, Toggle Type, Not Used in Model 770
M5	Lamp	701173	NE-51
M6	Lamp	701173	NE-51, Not Used in Model 770

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	701508	2 Used, Tone and Volume
Knob	040020	Catch Release, Not Used in Model 770
Knob	076265	Pause, Not Used in Model 770
Button	800440	Record
Button	800439	Push
Button	800441	Stop
Push Button	076263	Ass'y.
Case	040007	Ass'y, Not Used on Model 770
Case	076411	Ass'y. Model 770
Handle	430038	Not Used on Model 770
Handle	800860	Model 770

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401

Adjust volume control so that "Normal" lamp flashes, voltage across resistor should be 0.00033 - 0.00047 volts. Advance volume control until "Distort" lamp flashes; voltage should be 0.00065 - 0.00095 volts. NOTE: If V.T.V.M. will not indicate these low voltages, connect an oscilloscope in place of the meter and adjust Vertical gain of scope to produce a pattern of suitable amplitude; transfer scope leads to the low (10 ohm) section of a 1000/1 voltage divider, bridge complete divider with V.T.V.M. and oscillator. Adjust output of oscillator to produce the same scope deflection - voltage produced by record current will be approx. 1/1000 of meter reading.

Replace 6S4A tube in socket and insert a 1 ohm non-inductive resistor in series with the ground return (blue or black) lead from the erase head. Bridge resistor with a V.T.V.M. Depress "Record" button and measure the erase current. Current should produce a voltage of 0.04 volts minimum.

Bell & Howell Head

Use the same procedures as for Shure heads except insert 100 ohm non-inductive resistor in place of 10 ohm resistor. Bias current will produce a voltage of 0.013 - 0.018 volts. "Normal" lamp will flash at 0.0025 - 0.0035 volts. "Distort" lamp will flash at 0.0052 - 0.0068 volts. "Record Level" lamp on Model 770 will flash at 0.0036 - 0.005 volts.

Erase current will produce a voltage of 0.0042 volts across a 1 ohm resistor.

PARTS LIST

The following pages list, by part number and name, parts of the Tape Recorders covered in this manual. To help make positive identification of parts when ordering replacements, order by part number and model number and give serial number of Recorder.

The "Usable On Code" column refers to the model or models in which each part is used. Wherever "ALL" appears in this column, that particular part is used in all three models covered by this manual. Otherwise, the code is as follows:

775-G-1	Shure Head Model — Code A
775-G-10	Bell & Howell Head Model — Code B
770	Bell & Howell Head Model — Code C

MECHANICAL PARTS LIST

Fig. & Index No.	Part No.	Description	Usable on Code.
5A-1	700245	Screw, 4 - 40 x 1/4 Truss Head Phillips	ALL
" -2	700716	Washer, .116 x .281 x .020	ALL
" -3	800423	Spindle, Reel	ALL
" -4	800795	Cover Ass'y., Removable	ALL
" -5	076343	Top Plate Assembly	AB
" -5	076344	Top Plate Assembly	C
" -6	700245	Screw, 4 - 40 x 1/4 Truss Hd. (Attaching Parts)	ALL
" -7	800574	Cap, Neon Plastic	ALL
" -7A	700477	Nut, Hex., 9/16 — 27 (Attaching Part)	ALL
" -8	800573	Escutcheon, Counter	AB
" -9	700245	Screw, 4 - 40 x 1/4 Truss Hd. (Attaching Parts)	AB
" -9A	700550	Nut, Tinnerman (Attach. Parts)	AB
" -10	701508	Knob, Tone & Volume	ALL
" -11	800440	Button, Record	ALL
" -12	800439	Button, Push	ALL

Fig. & Index No.	Part No.	Description	Usable on Code.
5A-13	800441	Button, Stop	ALL
" -14	700890	"E" Ring, Retaining .187	ALL
" -15	076191	Rewind Idler Arm Assembly	ALL
" -16	700797	Washer, .191 x 7/16 Fibre	ALL
" -17	076183	Idler, Second Rewind	ALL
" -18	700890	"E" Ring, .187	ALL
" -19	700797	Washer, .191 x 7/16 Fibre	ALL
" -20	076180	Idler Wheel, Rewind Drive	ALL
" -21	076239	Idler Wheel, Fast Forward	ALL
" -22	700890	"E" Ring, .187	ALL
" -23	076190	Brake Assembly	AB
" -23	076402	Brake Assembly	C
" -23A	800478	Brake Lining	ALL
" -24	800536	Spring, Brake	ALL
" -25	700890	"E" Ring, .187	ALL
" -26	800536	Spring, Brake	ALL
" -27	700797	Washer, .191 x 7/16 Fibre	ALL
" -28	800572	Spring, Brake Actuating	ALL
" -29	700343	Screw, #6 x 1/4 Hex. Hd. Sht. Metal	ALL
" -30	700897	"E" Ring, .437 Shaft	A
" -31	800546	Spring, Azimuth	A
" -32	076195	Azimuth Plate (Record & Erase Head)	A
" -32	076415	Erase & Record Head Assembly (Bell & Howell)	BC
" -32A	800645	Base Housing	BC
" -32B	076178	Erase Head Assembly (Bell & Howell)	BC
" -32C	076179	Record Head Assembly (Bell & Howell)	BC
" -32D	700440	Set Screw (Attaching Part)	BC
" -32E	700188	Screw, 6 - 32 x 1/4 Fil. Hd. Phil. Mach. (Attaching Part)	BC
" -33	700183	Screw, 4 - 40 x 3/8 Fil. Hd. Phil. Mach.	A
" -34	700890	"E" Ring, .187	ALL
" -35	800023	Spring, Torsion	ALL
" -36	076212	Arm & Pad Assembly, Erase	A
" -36A	076273	Arm & Pad Assembly, Erase	BC
" -37	076232	Arm & Pad Assembly, Record & Play	A
" -37A	076274	Arm & Pad Assembly, Record & Play	BC
" -38	800564	Pad, Pressure	ALL
" -39	800564	Pad, Pressure	ALL
" -40	076194	Head Mtg. Bracket Assembly	A
" -40A	076272	Head Mtg. Bracket Assembly	BC
" -41	800476	Spring, Pressure Roller	ALL
" -42	700890	"E" Ring, .187	ALL
" -43	700806	Washer, Nylon, .191 x .375 x .015	ALL
" -44	800714	Pressure Roller	ALL
" -45	700807	Washer, Nylon, .257 x .437 x .015	ALL
" -46	076185	Pressure Roller Lever Assembly	AB
" -46	076326	Pressure Roller Lever Assembly	C
" -47	700890	"E" Ring, .187	ALL
5A-48	700088	Screw, Flat Hd., 4 - 40 x 1/4	AB
" -49	800599	Clips, Counter Mounting	AB
" -50	076261	Counter Assembly	AB
" -51	700797	Washer, .191 x 7/16 Fibre	ALL
" -52	700889	"E" Ring, .250	ALL
" -53	700798	Washer, .265 x 1/2 x .030 Fibre	ALL
" -54	800587	Spring, Speed Change Shaft	ALL
" -55	700797	Washer, .191 x 7/16 Fibre	ALL
" -56	700797	Washer, .191 x 7/16 Fibre	ALL
" -57	700889	"E" Ring, .250	ALL
" -58	700798	Washer, .265 x 1/2 x .030 Fibre	ALL
" -59	800607	Link, Remote Control	AB
" -60	700797	Washer, .191 x 7/16 Fibre	AB
" -61	700553	Pin, Cotter 1/16 x 3/8	AB
" -62	800560	Lever, Pause	AB
" -62A	076265	Knob, Pause	AB

Fig. & Index No.	Part No.	Description	Usable on Code.
5A-63	076189	Mechanism Plate Assembly	AB
" -63	076403	Mechanism Plate Assembly	C
" -63A	701367	Grommets, Rubber	ALL
" -63B	700348	Screws, Hex. Hd. Sht. Mtl.	ALL
" -63C	800728	Nut, Lock, Jack	ALL
5B-63	076189	Mechanism Plate Assembly	AB
" -63	076403	Mechanism Plate Assembly	C
" -64	800548	Spring, Fast Forward Idler	ALL
" -65	076260	Forward Idler Lever Assembly	ALL
" -66	800576	Retractor	ALL
" -67	700894	"E" Ring, .375	ALL
" -68	800477	Spring, Rewind Idler	ALL
" -69	076184	Rewind Lever Assembly	ALL
" -70	076186	Take-Up Arm Assembly	ALL
" -71	076263	Pushbutton Assembly	ALL
" -72	700345	Screw, #10 x 1/4 Hex. Hd. Sht. Metal (Attaching Parts)	ALL
5B-73	076201	Pressure Roller Link Assembly	ALL
" -74	076202	Rewind Lever Link Assembly	ALL
" -75	076200	Forward Lever Link Assembly	ALL
" -75A	800547	Spring, Fast Forward Lever	ALL
" -76	700712	Washer, .196 x 7/16 x .030 Steel	ALL
" -77	700890	"E" Ring, .187	ALL
" -78	800624	Brake Lever	ALL
" -78A	700438	Screw, Set, #6 - 32 x 3/16 Cone Pt. (Attaching Part)	ALL
" -79	076199	Speed Change Shaft Assembly	ALL
" -80	700895	"E" Ring, .312	ALL
" -81	076198	Speed Change Link Assembly	ALL
" -82	700806	Washer, .191 x .375 x .015 Nylon	ALL
" -83	076180	Idler Wheel Assembly, Speed Change	ALL
" -84	700806	Washer, .191 x .375 x .015 Nylon	ALL
" -85	700890	"E" Ring, .187	ALL
" -86	800545	Spring, Take-Up Idler	ALL
" -87	076192	Take-Up Idler Lever Assembly	ALL
" -88	700797	Washer, .191 x 7/16 x .015 Fibre	ALL
" -89	076204	Idler Wheel, Take-Up Assembly	ALL
" -90	700797	Washer, Fibre (Attaching Part)	ALL
" -91	700890	"E" Ring, .187 (Attaching Part)	ALL
" -92	700896	"E" Ring, .437	ALL
" -93	800461	Shaft, Take-Up Spindle	ALL
" -94	700797	Washer, .191 x 7/16 x .015 Fibre	ALL
" -95	076196	Wheel Assembly, Clutch	ALL
" -96	800459	Lining, Clutch	ALL
" -97	800458	Plate, Clutch	ALL
" -98	800460	Spring, Clutch	ALL
" -99	800655	Washer, .484 x 3/4 x .010 Fibre	ALL
" -100	800542	Pulley, Clutch	ALL
" -100A	700424	Screw, Set	ALL
" -101	800544	Belt, Counter	AB
" -102	076231	Capstan & Flywheel Assembly	ALL
" -103	800568	Ball Bearing .1875 Dia.	ALL
" -104	800520	Pulley, Forward & Rewind	ALL
" -104A	700420	Screw, Set, 8 - 32 x 1/4 (Attaching Part)	ALL
" -105	800462	Pulley, Drive	ALL
" -105A	700420	Screw, Set, #8 - 32 x 1/4 (Attaching Part)	ALL
" -106	076188	Sub-Plate Assembly	ALL
" -107	700734	Washer, #10 Ext. Tooth (Attaching Part)	ALL
" -108	700230	Screw, #10 - 32 x 3/8 Hex. Hd. (Attaching Parts)	ALL
" -109	701338	Mount, Rubber Shock	ALL
" -110	076264	Plate Assembly, Motor Mtg.: Includes	ALL
"	800435	Plate, Motor Mtg.	ALL
"	701338	Mount, Rubber Shock	ALL
" -111	701426	Motor, Drive	ALL

MECHANICAL PARTS LIST (Cont.)

Fig. & Index No.	Part No.	Description	Usable on Code.
5B-112	700348	Screw, Sht. Metal, #10 x 1/4 Hex. Hd. (Attaching Part for Motor Mtg. Plate Assembly)	ALL
" -113	701587	Fan, Ventilating	ALL
" -113A	700424	Screw, Set (Attaching Part)	ALL
" -114	800479	Shaft, Spindle Rewind	ALL
" -115	700798	Washer, .265 x 1/2 Fibre (Attaching Part)	ALL
" -116	700889	"E" Ring, .250 (Attaching Part)	ALL
	076284	Back Plate Assembly (Not Shown On Exploded View)	BC
	076209	Back Plate Assembly (Not Shown On Exploded View)	A

ACCESSORIES

Part No.	Description	Usable on Code
800449	Microphone	ALL
701317	Power Cord	ALL
800077	Reel 7"	ALL
076223	Cord, Ass'y. Input (Fits All Models)	B
701014	Plug, 3 Conductor	B
702011	Resistor, Carbon 22KΩ, 1/3 W.	B
701202	Cord, 2 Conductor 72"	B
701039	Clip, Alligator	B

CASE PARTS LIST (NOT SHOWN IN DIAGRAM FORM)

Part No.	Description	Usable on Code.
040007	Case Assembly	AB
430094	Screw #8 - 32 x 3/8" Ph. Rd. Hd. (Case Front to Chassis)	AB
430103	Foot, Plastic	ALL
430093	Screw, 8 - 32 x 7/8" Ph. Rd. Hd. (Attaching Part)	ALL
430092	Screw, #8 - 32 x 5/16" Ph. Rd. Hd. (Rear Bottom To Chassis)	AB
040024	Cover Ass'y., Case	AB
430038	Handle, (Attaching Screws Exposed	AB
430145	Screw, #10 x 3/8" F-Z Hex Hd. Self Tap. (Attaching Parts)	AB
24736	Nut, Speed (Attaching Parts)	AB
040015	Handle (Attached W/Hidden Rivets) Replace with 430038	AB
076362	Grille Ass'y, Bottom (Less Nameplate)	ALL
430103	Foot, Plastic	ALL
430086	Rivet, Tubular (Attaching Part-Foot)	ALL
430087	Rivet, Tubular (Attaching Part For Nameplate)	ALL
430091	Screw, 8 - 32 x 3/8 Ph. Bd. Hd. Sht. Metal	AB
430102	Nut, Speed #8	AB
040020	Knob, Catch Release	AB
430156	Actuator, Latch L.H.	AB
430157	Actuator, Latch R.H.	AB
430106	Stud (Attaching Part)	AB
11921	Spring, Latch	AB
040026	Baffle Board L.H.	AB
040027	Baffle Board R.H.	AB
430123	Screw, #8 x 3/8 Sht. Mtl. Hex. Hd. (Attaching Part)	AB
800617	Gasket, Speaker	AB
076411	Case, Assembly	C
430103	Foot, Plastic	ALL
430093	Screw, #8 - 32 x 7/8 Ph. Rd. Hd. (Attaching Part)	ALL
800649	Screw, #8 - 32 Ph. Truss Hd. (Attaching Mech. To Case)	C
700545	Nut, Tinnerman — (Attaching Bottom Mech. To Case)	C
800650	Screw, 8 - 32 x 1 1/8" Lg. Oval Hd. Ph. (Attaching Front Mech. To Case)	C
800651	Washer, Finishing (Attaching Front Mech. To Case)	C
076362	Grille Ass'y, Bottom (Less Nameplate)	ALL

CASE PARTS LIST (NOT SHOWN IN DIAGRAM FORM) (Cont.)

Part No.	Description	Usable on Code.
430103	Foot, Plastic	ALL
430086	Rivet, Tubular (Attaching Part - Foot)	ALL
430087	Rivet, Tubular (Attaching - Nameplate)	ALL
800649	Screw, #8 - 32 x 3/4" Truss (Attaching Part - Grille)	C
700545	Nut, Tinnerman (Attaching Part - Grille)	C
800860	Handle, Plastic	C
800862	Post, Handle	C
700666	Washer, 3/16 x 5/8 x .042 (Attaching Part)	C
800803	Screw, #8 - 32 x 5/8 Hex. Hd. (Attaching Part)	C
700739	Washer, Lock, Internal #8 (Attaching Part)	C
800863	Latch, Case	C
800861	Hinge, Case	C
800864	Foot, Glide	C
802770	Baffle, Speaker	C

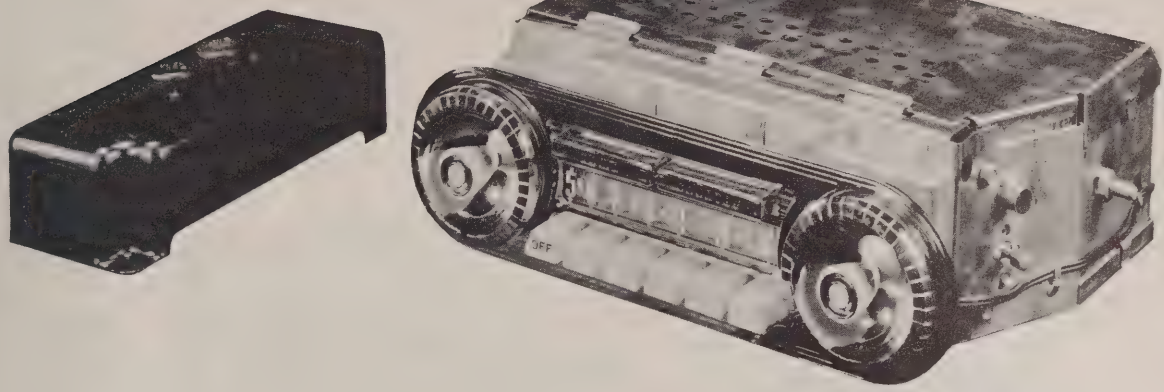
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

EDSEL
MODEL 87SE

EDSEL
MODEL 87SE



TRADE NAME	Edsel Model 87SE (For 1958 Edsel Automobiles)
MANUFACTURER	Stromberg-Carlson National Service Dept., 1400N. Goodman St., Rochester 3, N.Y.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver with Transistorized Output
TUBES (Seven)	Types 12AD6 RF Amplifier, 12AD6 Converter, 12AF6 1st IF Amplifier, 12AF6 2nd IF Amplifier, 12EL6 Det.-AVC-AF Amp., 12K5 Driver, 12AL8 Relay Control.
POWER SUPPLY	12Volt Storage Battery RATING 2Amp. @12.6 volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

EDSEL
MODEL 87SE

TRANSISTOR BIAS ADJUSTMENT (R5 & R6)

The bias adjustment should be checked after a transistor is replaced.
Connect a VTVM across the primary of the output transformer T2 (pin 9 of each transistor socket).
Connect a power source of 14.4 volts DC in series with a DC ammeter to the junction of R35, R37 and allow a three minute warm-up period.
Adjust R5 and R6 for a zero reading on the VTVM and a 1 Amp. reading on the ammeter.
If the VTVM will not indicate zero volts with 1 Amp. of current, the transistor associated with the fully clockwise control is weak. If the ammeter will not indicate 1 Amp., both transistors are weak.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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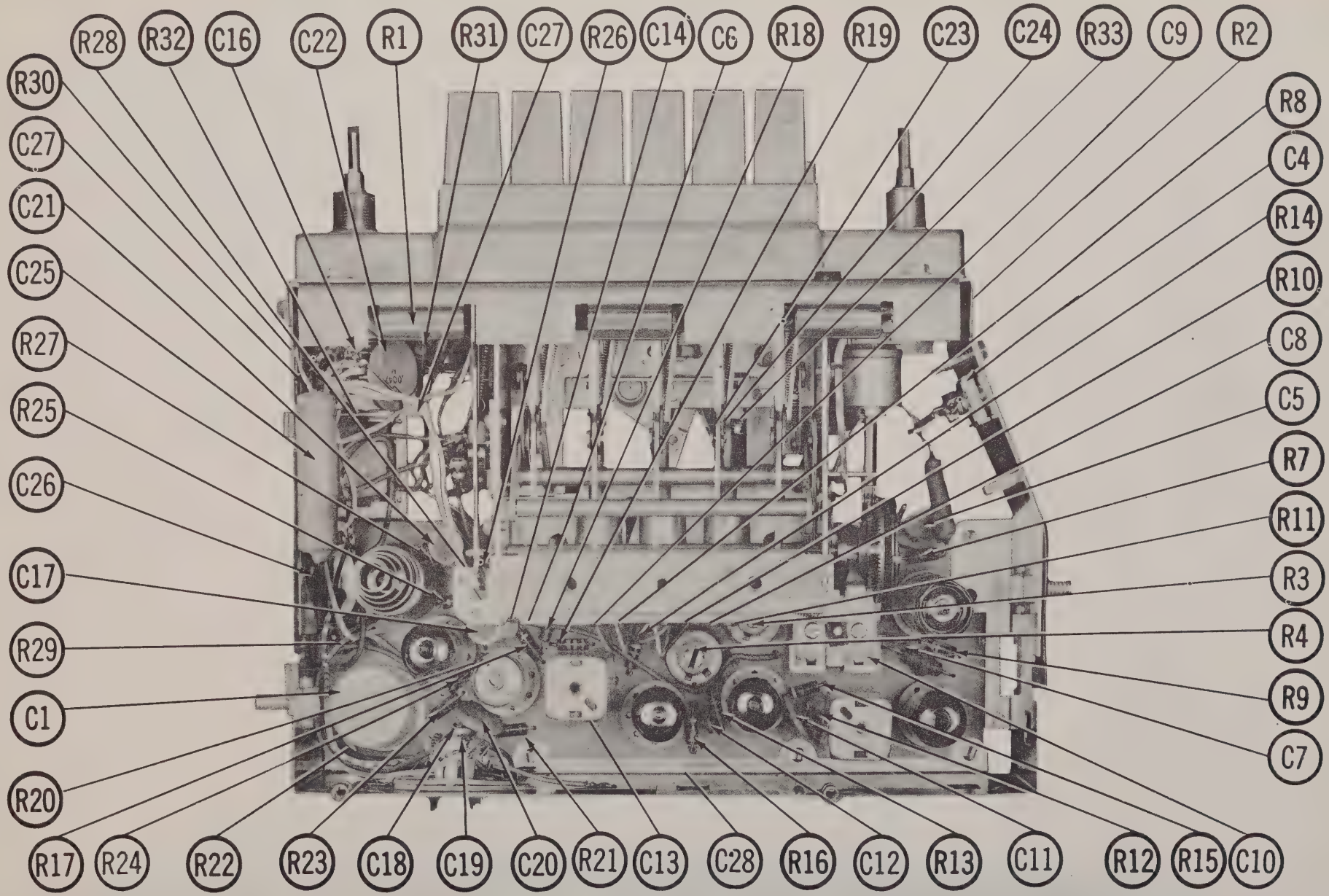
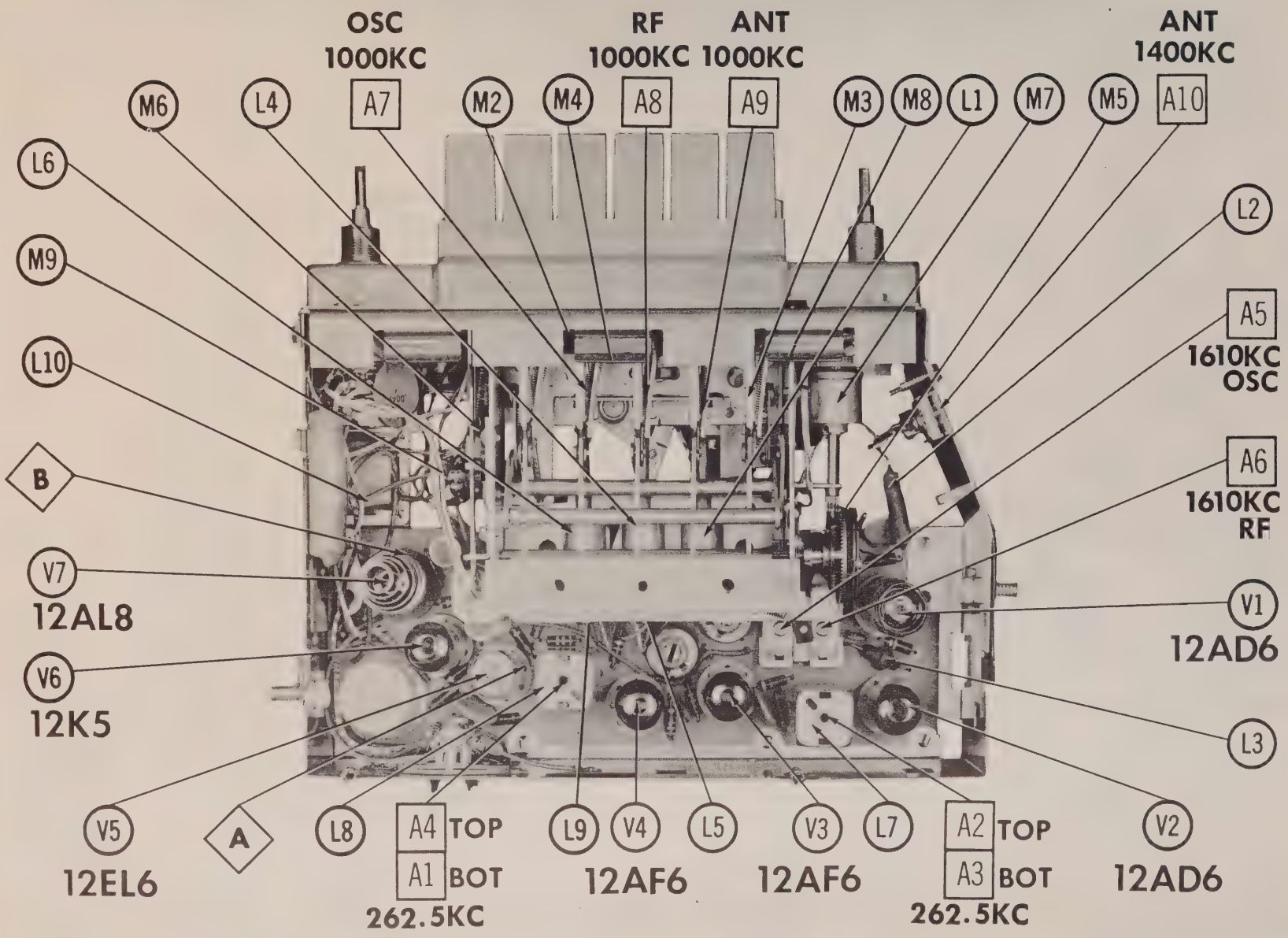
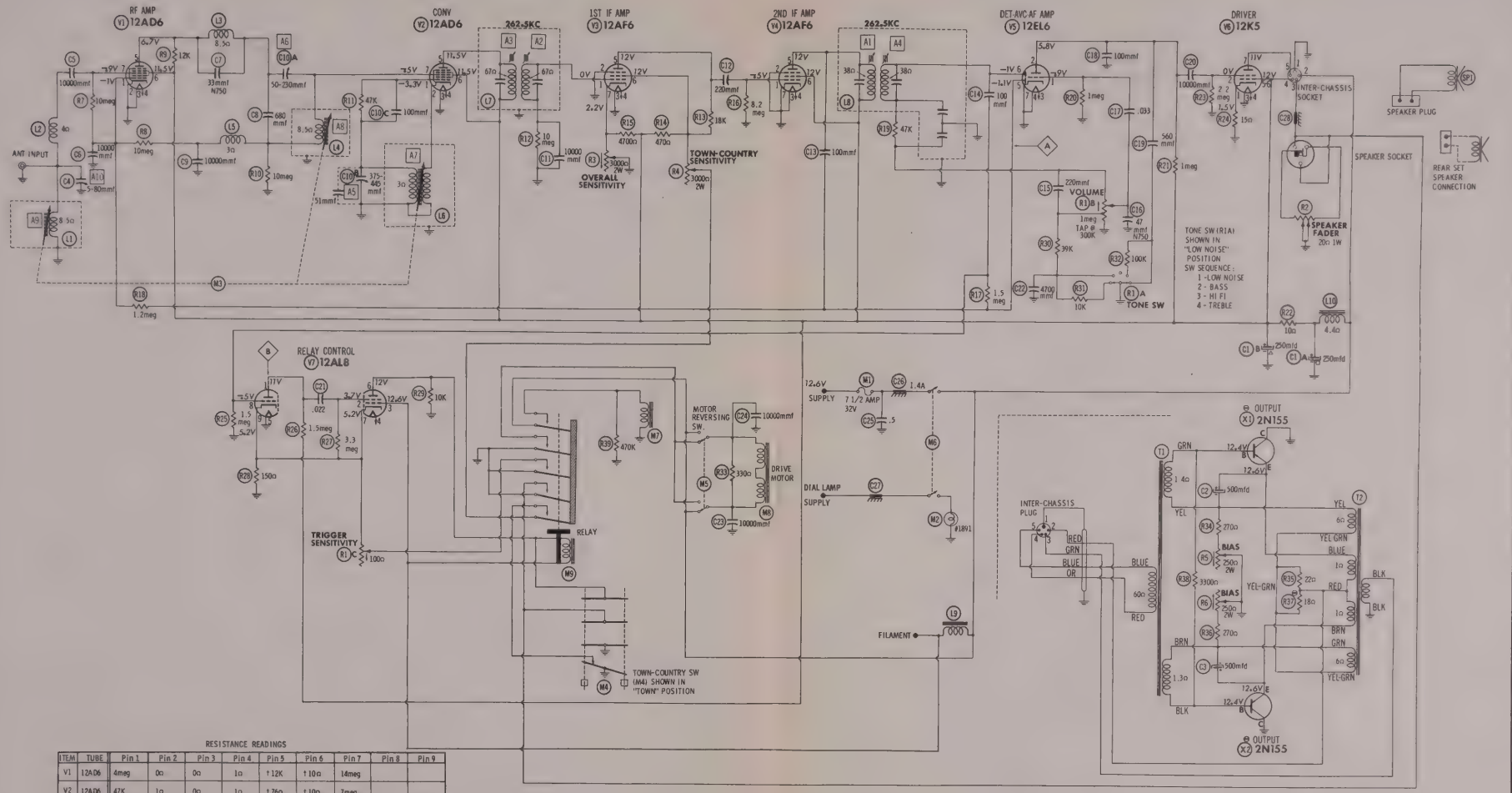


CHASSIS TOP VIEW--RESISTOR & CAPACITOR IDENTIFICATION



CHASSIS TOP VIEW—ALIGN, INDUCTOR, TUBE & MISC IDENT

MODEL 875E



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AD6	4meg	0Ω	0Ω	1Ω	†12K	†10Ω	14meg		
V2	12AD6	47K	1Ω	0Ω	1Ω	†76Ω	†10Ω	7meg		
V3	12AF6	10meg	0Ω	0Ω	1Ω	†18K	†480Ω	870Ω		
V4	12AF6	8.2meg	0Ω	0Ω	1Ω	†48Ω	†10Ω	0Ω		
V5	12EL6	1meg	†1meg	1Ω	0Ω	3meg	1meg	0Ω		
V6	12K5	15Ω	2.2meg	0Ω	.1Ω	†10Ω	†10Ω	†70Ω		
V7	12AL8	†1.5meg	3.3meg	†1Ω	1Ω	0Ω	†70Ω	120Ω	1.5meg	120Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

† MEASURED FROM POSITIVE TERMINAL OF C1A

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

403-7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2) Low side to chassis.	262.5KC (400% Mod)	High freq. end of band.	DC probe thru 22meg to point (A) Common to chassis.	A1, A2, A3	Adjust for maximum deflection
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy to Ant. receptacle.	1610KC	"	Output meter Across Voice Coil	A5, A6	Adjust for maximum output.
	Step 4 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, remove escutcheon, dial background, and lamp socket to expose tuning cores. Repeat Step 3.						
4.	Fig. 1	Thru dummy to Ant. receptacle.	1000KC	Tuner carriage ½" from High Freq. end stop.	Output meter Across Voice Coil.	A7, A8, A9	Adjust for maximum output Repeat Steps 3 & 4.
5.	"	"	1400KC	1400KC	"	A10	Adjust for maximum output.
	The following steps should not be attempted unless accurate sensitive equipment is available and then only after exhausting the possibility of component failure.						
6.	Fig. 1	Thru dummy to Ant. receptacle .	1400KC			R3	Adjust generator output for 4.5 microvolts. Adjust R3 for 1 watt output.
7.	Fig. 1	Thru dummy to Ant. receptacle.	1400KC	1400KC	AC probe to point (B) Common to chassis.	R1C	Adjust generator output for 30 microvolts. Turn volume (R1B) to MINIMUM. Short arm of Trigger Sensitivity (R1C) to chassis. Adjust R1C for maximum deflection. Remove short.
8.	"	"	1400KC	"	Output meter Across Voice Coil.	R4	Adjust generator output for 70 microvolts. Turn volume (R1B) to maximum. Short arm of R4 to chassis. Adjust R4 for 1 watt output. Remove short.
9.	"	"	1400KC				Adjust generator output for 20 microvolts. Depress "Country" bar. If seeker does not stop on signal, repeat Steps 7 & 9.
10.	"	"	1400KC				Adjust generator output for 250-300 microvolts. Depress "Town" bar If seeker does not stop on signal, repeat Steps 8& 10

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

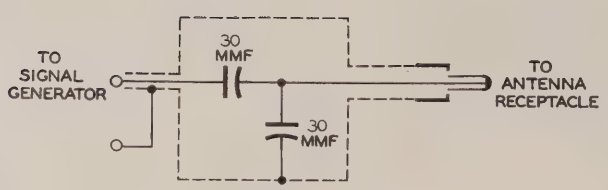


FIG. 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AD6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V4	2nd IF Amplifier	12AF6	
V5	Det-AVC-AF Amp	12EL6	
V6	Driver	12K5	
V7	Relay Control	12AL8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N155	Output	2N155	2N301		2N242	Note 1
X2	2N155	Output	2N155	2N301		2N242	Note 1

Note. 1. Alternate type 2N257

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Stromberg - Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■250	16	111001-003	AFH2-02-05		WP200.7			R2564*
B	▲250	16							
C2	500	3	111001-004	PRS6V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103
C3	500	3	111001-004	PRS6V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103

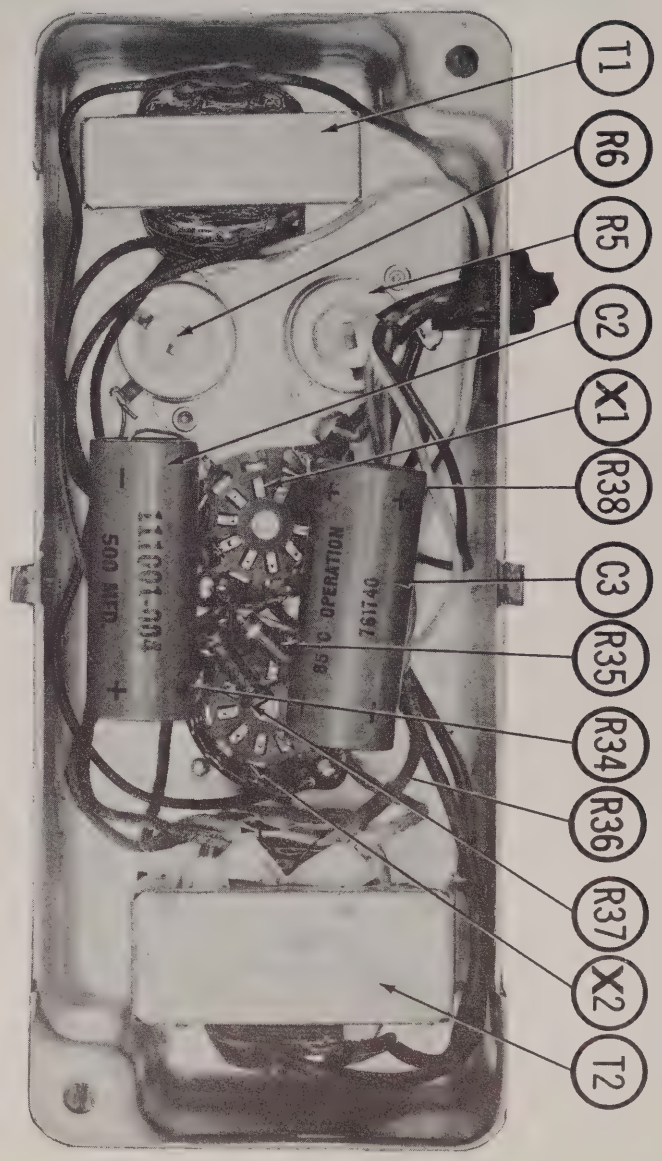
* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	5-80		110000-001						
C5	10000		110002-026	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	10000		110919-000	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C7	33		110002-051	N750-DI33	DTN-33	C10Q33U		5TCU-Q33	N750
C8	680		110915-000	1467-00068	D6-681	5W5T68	UC5368	1FM-368	
C9	10000		110002-026	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C10A	50-230								
B	375-445		110000-010						
C	100								
C11	10000		110002-026	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C12	220		110002-042	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C13	100		110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C14	100		110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C15	220		110921-000	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C16	47		110917-000	N750-DI47	DTN-47	C10Q47U	NT-5447	5TCU-Q47	N750
C17	.033	200	110003-002	P288N-033		BC2S33J		2SE-S33	
C18	100		110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C19	560		110002-056	BPD-00056	DD-561	L10T56	UC-5356	5GA-T56	
C20	10000		110919-000	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C21	.022	200	110003-001	P288N-022	DD-203	BC2S22J		2SE-S22	
C22	4700		110920-000	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C23	10000		110672-000	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C24	10000		110672-000	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C25	.5	50	110628-000	P288N-5		CUB2P5	GEM-205	2TM-P5	
C26									
C27									
C28									

POWER CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		145000-002					Tone Switch
B	1meg	½						Volume, Tap @ 300K
C	100Ω	½						Trigger Sensitivity
R2	20Ω	1(WW)	145000-010					Speaker Fader
R3	3000Ω	2(WW)	145000-030					Sensitivity (Overall)
R4	3000Ω	2(WW)	145000-030					Sensitivity (Town-Country)
R5	250Ω	2(WW)	145000-020					Transistor Bias
R6	250Ω	2(WW)	145000-020					Transistor Bias

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Stromberg-Carlson PART No.	NOTES
	OHMS	WATT		
R7	10meg		554002-106	
R8	10meg		554001-106	
R9	12K		554001-123	
R10	10meg		554001-106	
R11	47K		554002-473	
R12	10meg		554002-106	
R13	18K		554001-183	
R14	470Ω		554002-471	
R15	4700Ω		554002-472	
R16	8.2meg		554001-825	
R17	1.5meg		554001-155	
R18	1.2meg		554001-125	
R19	47K		554002-473	
R20	1meg		554002-105	
R21	1meg		554002-105	
R22	10Ω		554001-100	
R23	2.2meg		554002-225	

ITEM No.	RATING		Stromberg-Carlson PART No.	NOTES
	OHMS	WATT		
R24	15Ω		554001-150	
R25	1.5meg		554001-155	
R26	1.5meg		554001-155	
R27	3.3meg		554002-335	
R28	150Ω		554002-151	
R29	10K		554002-103	
R30	39K		554001-393	
R31	10K		554001-103	
R32	100K		554002-104	
R33	330Ω		554002-331	
R34	370Ω		554002-271	
R35	22Ω		554002-220	
R36	270Ω		554002-271	
R37	18Ω		149559-000	Note 1.
R38	3300Ω		554002-332	
R39	470K		554002-471	

Note. 1. Temperature compensating unit.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9:	1	161000-010							
		SEC. 2								
		1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE			REPLACEMENT DATA							NOTES
	PRI.	SEC.		Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	1	1	2								
T2	35.8Ω	35.8Ω	3.4Ω	161000-020							
	TURNS RATIO										
	3.4	3.4	:1								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Stromberg-Carlson PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	155000-001	69A2	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Stromberg-Carlson PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil						Note. 1
L2	Ant. Coil	114000-002	19-3036	TV-180	6176	VP-1	36 Microhenries
L3	RF Choke	114000-004	193160	TV-196	6120	VP-5	166 Microhenries
L4	Mixer Coil						Note 1.
L5	RF Choke	114000-003					29 Microhenries.
L6	Osc. Coil						Note. 1
L7	Input IF	114000-020		BC-344 *	13-PH1 *		
L8	Output IF	114000-040		BC-346 *	13-PH6 *		
L9	Fil. Choke	114000-001					

Note. Part of M3
*Drill hole in printed board for bottom slug adjustment

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	.068A	4.4Ω	.09HY	161000-002						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Stromberg-Carlson PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V		128000-001	30707.5 (7½A 32V)	155009	SFE 7½ (7½A 32V)	HDH

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M2	Lamp	137000-002	#1891
M3	Tuner Coil Ass'y	171000-162	
M4	Switch Ass'y	158000-020	Town & Country
M5	Switch	171000-169	Motor Reversing
M6	Switch	171000-168	On-Off (DPDT)
M7	Clutch Ass'y	171000-150	
M8	Drive Motor	171000-172	
M9	Relay	172000-010	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Push Button	171000-013	Town
Push Button	171000-014	Country
Push Button	107000-001	Left Hand (Off) Gray
Push Button	107000-005	Right Hand, Gray
Push Button	107000-009	Gray (4 used)
Push Button	107000-002	Left Hand (Off) White
Push Button	107000-006	Right Hand, White
Push Button	107000-010	White (4 used)
Dial	122000-002	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GRUNDIG MAJESTIC MODEL 7068

GRUNDIG MAJESTIC
MODEL 7068

GRUNDIG MAJESTIC
MODEL 7068

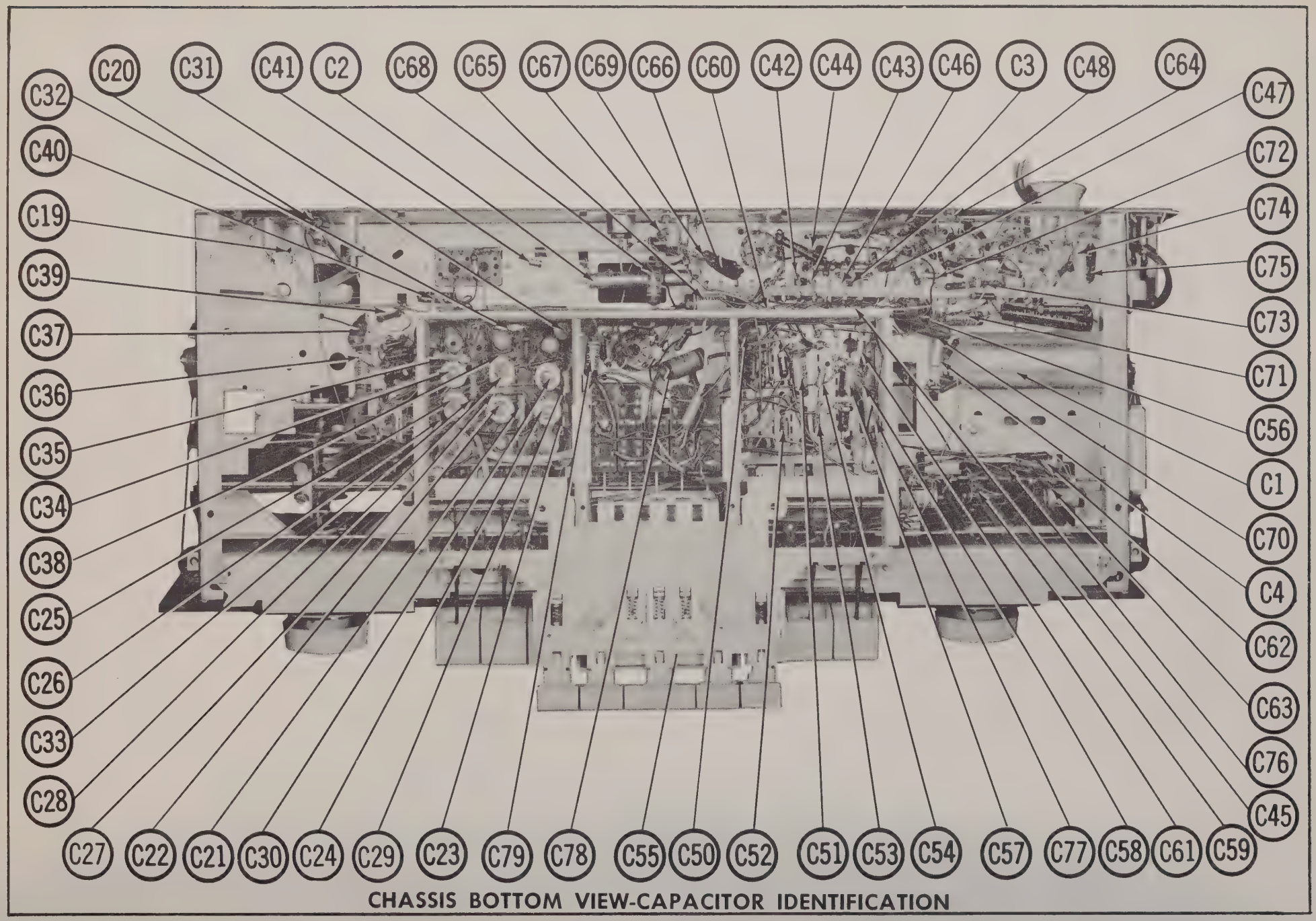
TRADE NAME	Grundig Majestic Model 7068		
SUPPLIER	Majestic International Sales Corp., 743 W. LaSalle Street, Chicago 10, Illinois		
TYPE SET	AC Operated FM-BC-SW Receiver With 4 Speed Automatic Record Changer		
TUBES (Eight)	Types 6AQ8/ECC85 FM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM Osc., EF89 2nd FM-1st AM IF Amp., 6T8/EABC80 Ratio Det.-AM Det.-AVC-AF Amp., 6CD7/EM34-35 Tuning Indicator, 12AX7/ECC83 Phono Preamplifier-Phase Inverter, (2) EL95 Output		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.52 Amp. @ 117 Volts AC (51 Watts)
TUNING RANGES	BROADCAST 510-1620KC FREQ. MOD. 88-108MC	SHORTWAVE I SHORTWAVE II	3.2-8.5MC 8.3-18.5MC

RECORD CHANGER—PERPETUUM-EBNER MODEL REX DELUXE

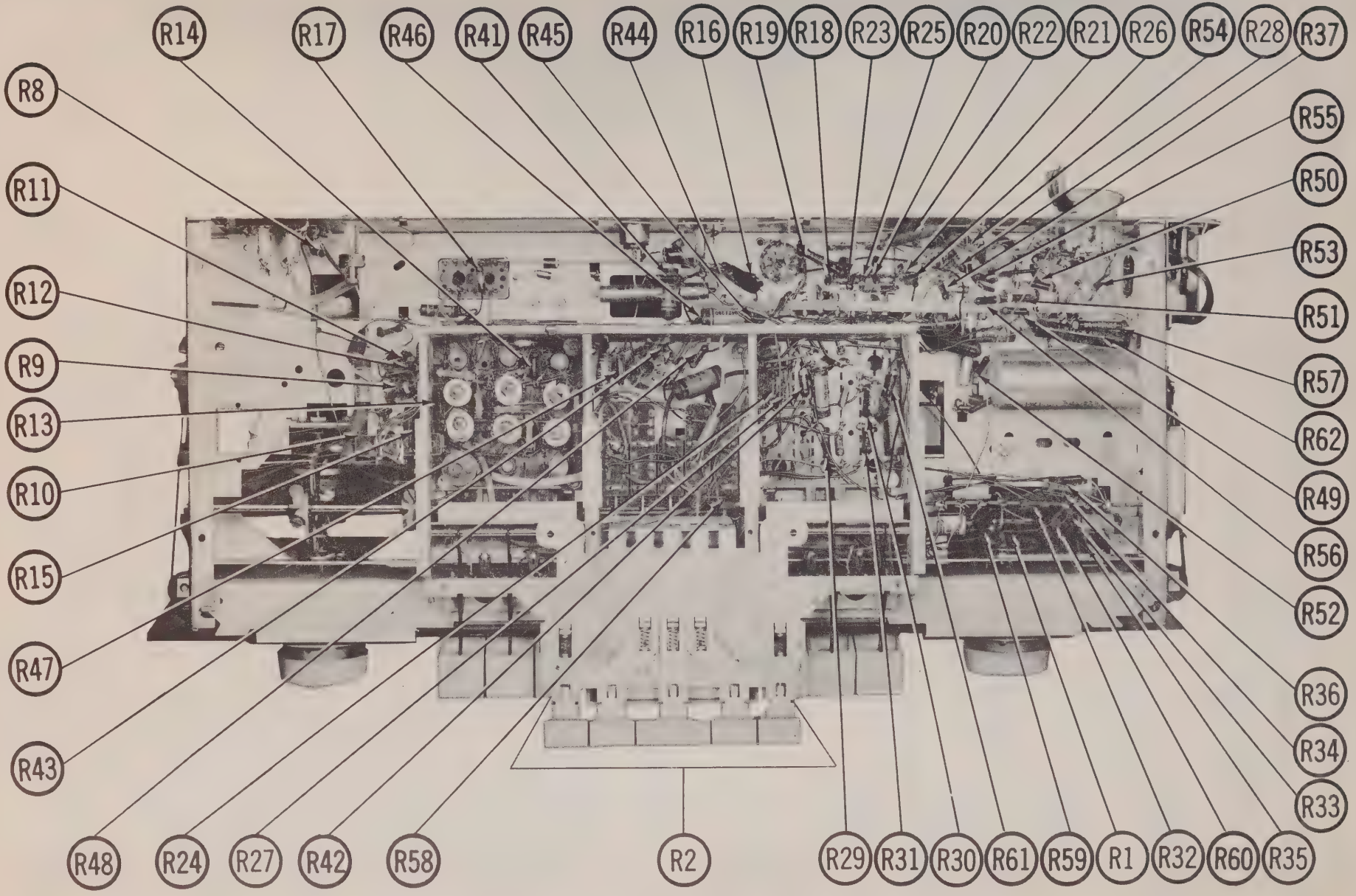
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H412



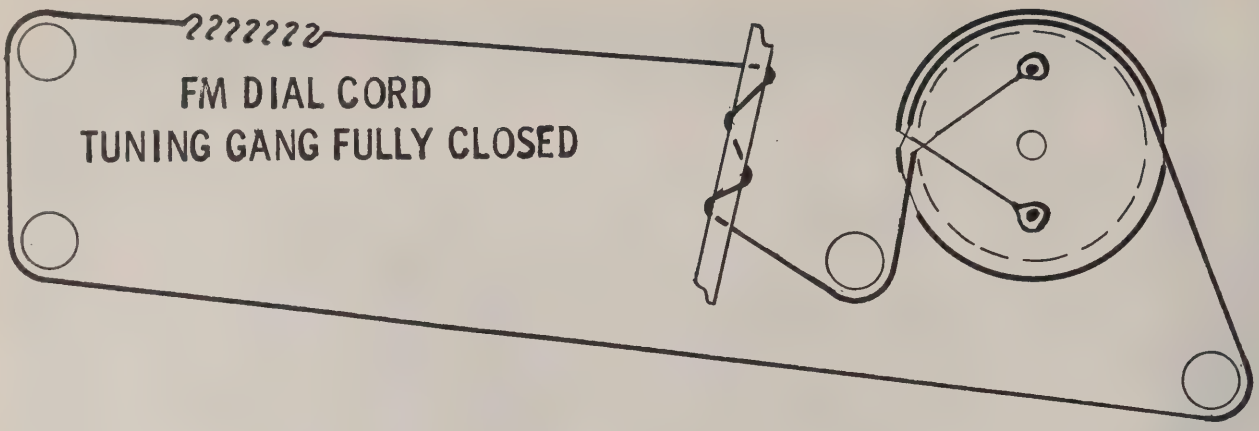
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

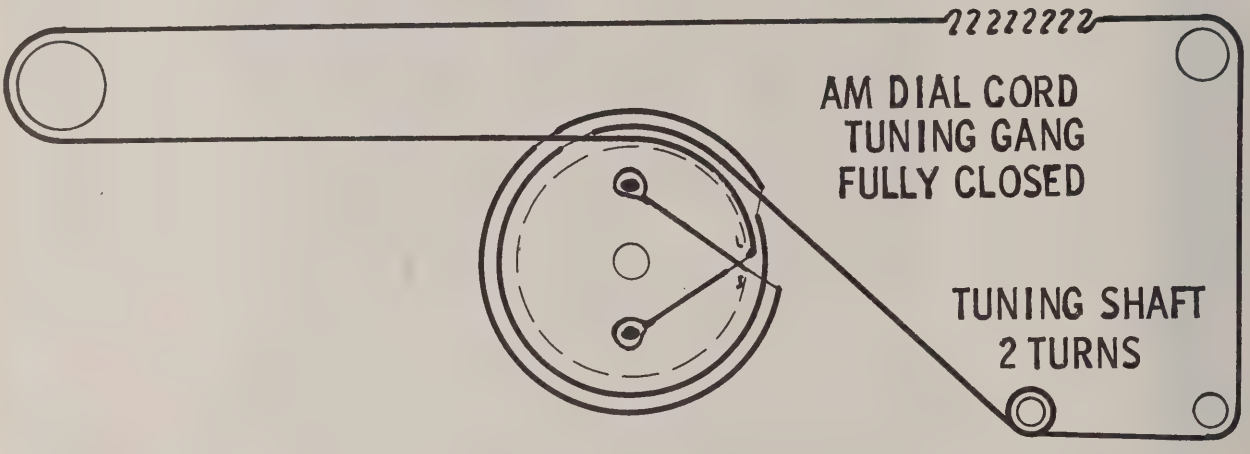


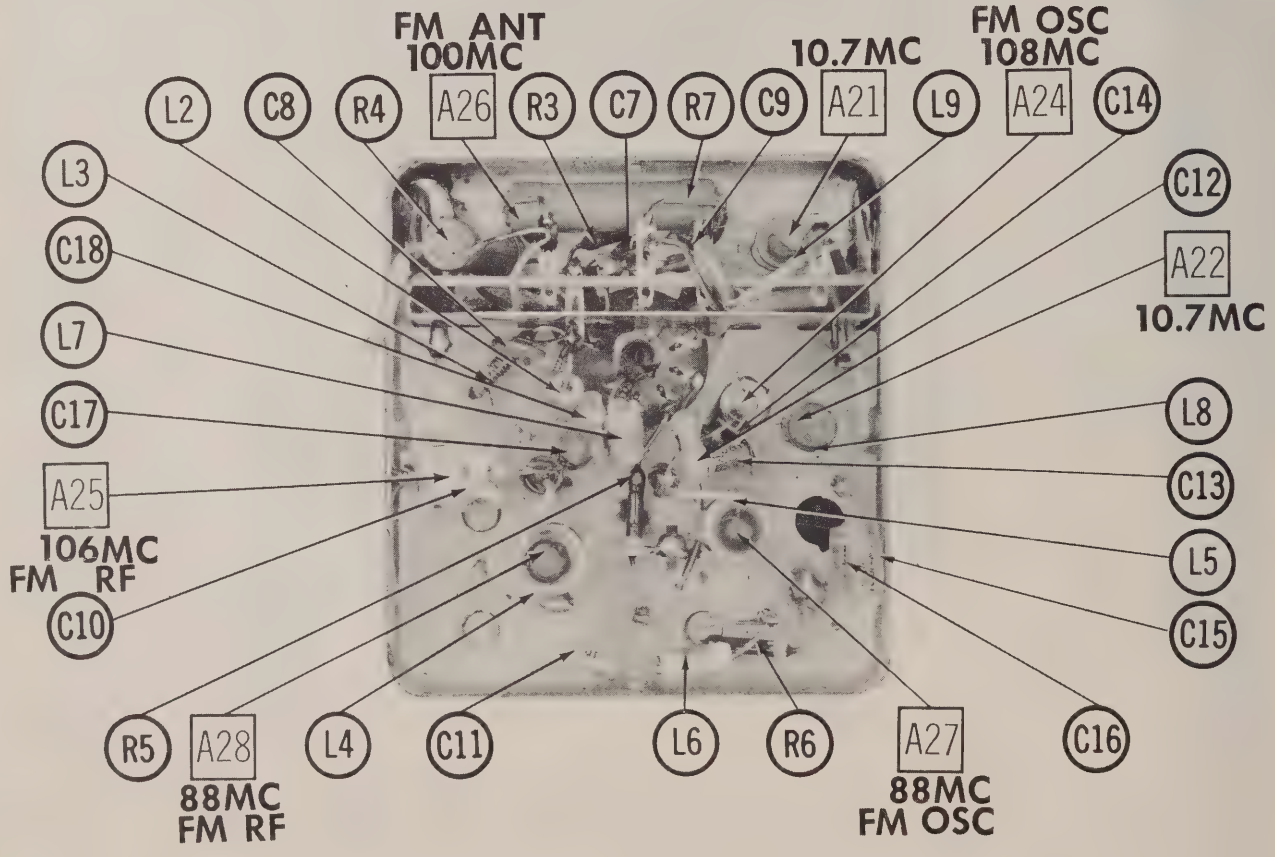
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

GRUNDIG MAJESTIC
MODEL 7068

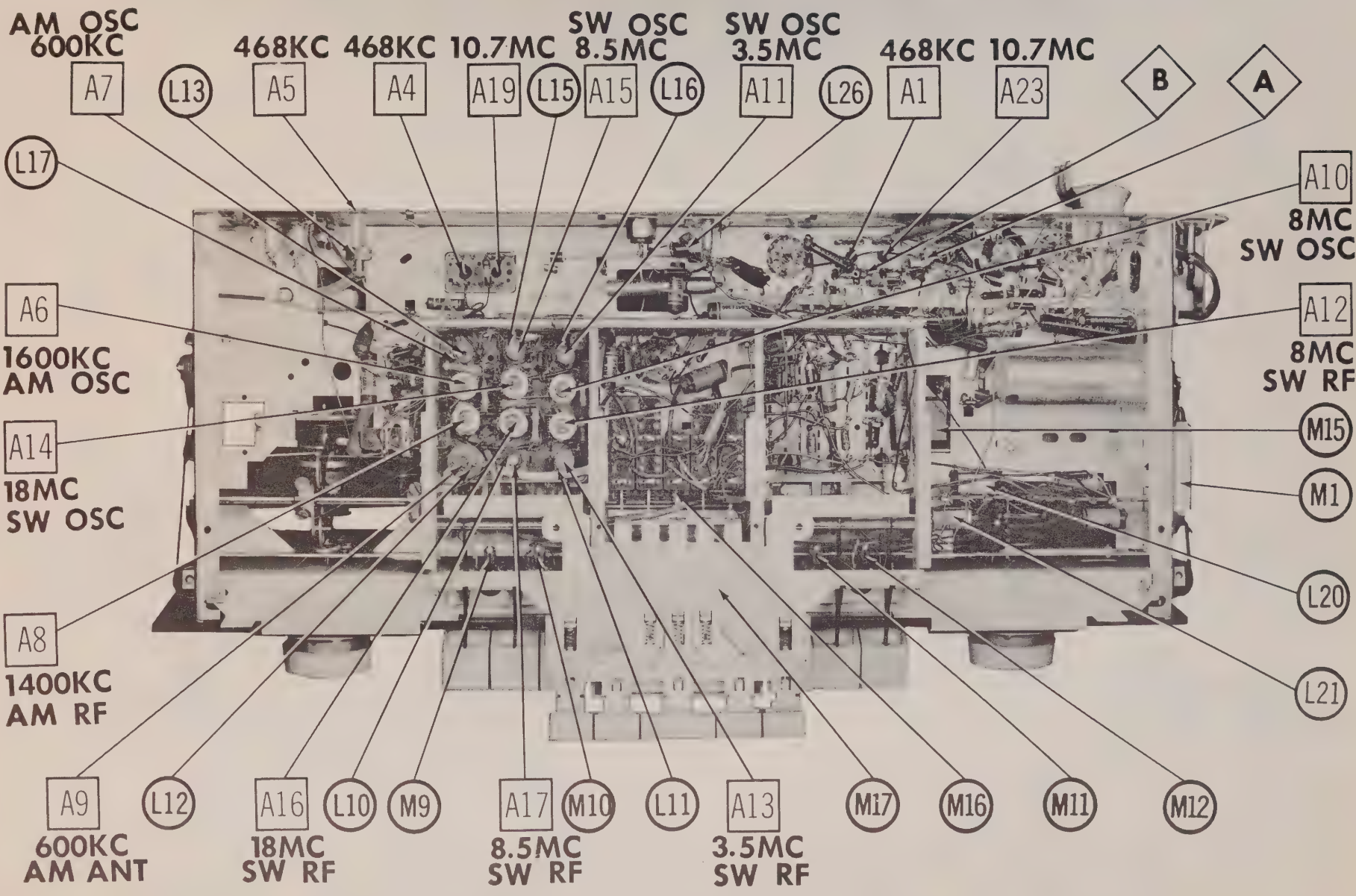
FOLDER 8



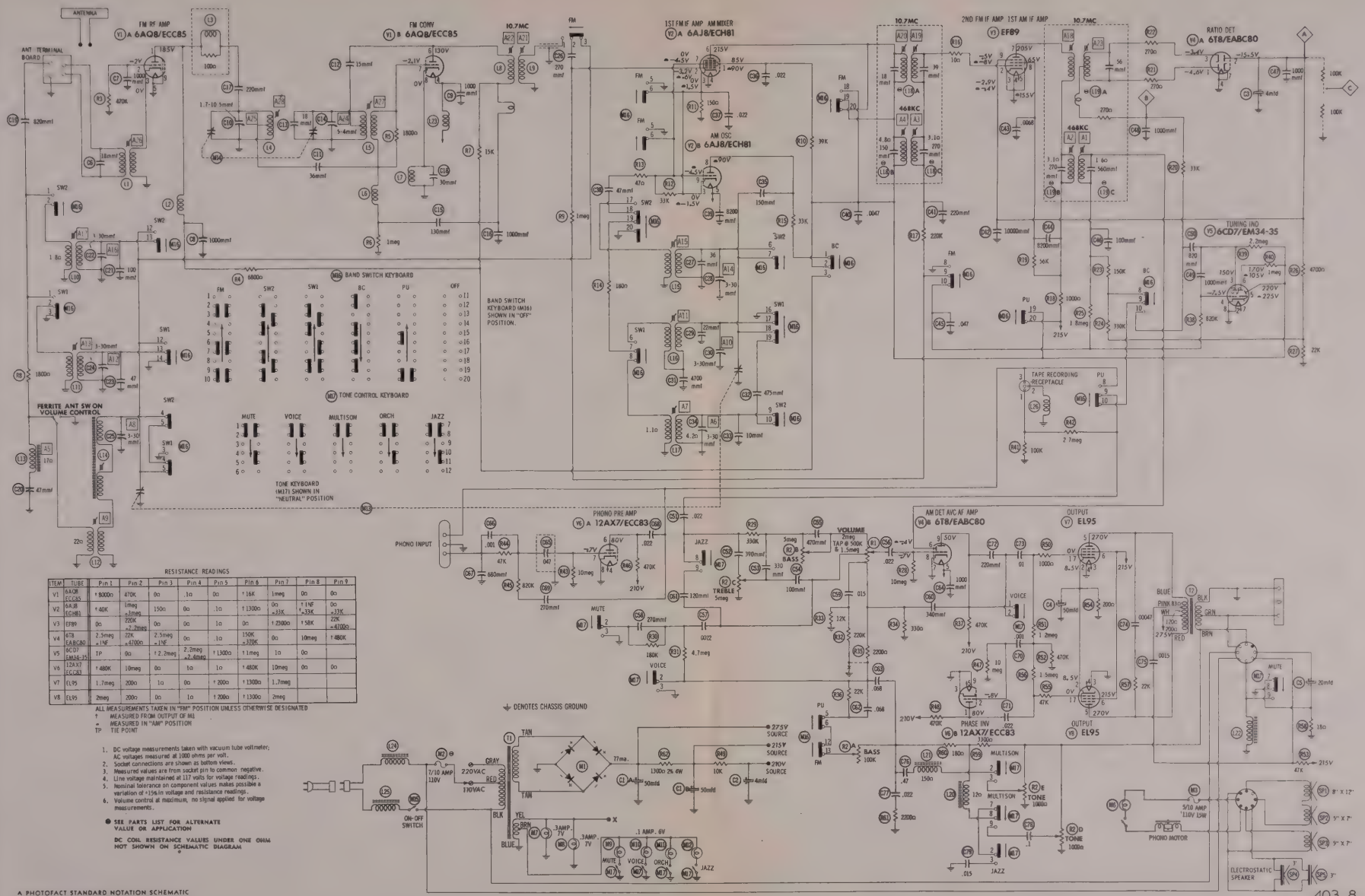




FM RF SUB CHASSIS



CHASSIS BOTTOM VIEW - ALIGN, INDUCTOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8 ECC85	↑ 8000a	470K	0a	.1a	0a	↑ 16K	1meg	0a	0a
V2	6AJ8 ECH81	↑ 40K	1meg =31meg	150a	0a	.1a	↑ 1300a	0a =33K	↑ INF =33K	0a =33K
V3	EF89	0a	220K =2.2meg	0a	0a	1a	0a	↑ 2500a	↑ 58K	22K =4700a
V4	6T8 EABC80	2.5meg =1MF	22K =47000a	2.5meg =1MF	0a	.1a	150K =220K	0a	10meg	↑ 480K
V5	6CD7 EM34-35	TP	0a	↑ 2.2meg	2.2meg =2.4meg	↑ 1300a	↑ 1meg	1a	0a	
V6	12AX7 ECC83	↑ 480K	10meg	0a	1a	1a	↑ 480K	10meg	0a	0a
V7	EL95	1.7meg	200a	1a	0a	↑ 200a	↑ 1300a	1.7meg		
V8	EL95	2meg	200a	0a	1a	↑ 200a	↑ 1300a	2meg		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
↑ MEASURED FROM OUTPUT OF M1
= MEASURED IN "AM" POSITION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	468KC (400∿ Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4,	Adjust for maximum output.
2.	"	High side to AM Ant. term. Low side to chassis.	"	"	"	"	A5	"
3.	"	"	1600KC	"	1600KC	"	A6	"
4.	"	"	600KC	"	600KC	"	A7	"
5.	"	"	1400KC	"	1400KC	"	A8	"
6.	"	"	600KC	"	600KC	"	A9	Adjust for maximum output. Repeat steps 5 and 6.
7.	200mmf	"	8.0MC	SWI	8.0MC	"	A10	Adjust for maximum output.
8.	"	"	3.5MC	"	3.5MC	"	A11	Adjust for maximum output. Repeat steps 7 and 8.
9.	"	"	8.0MC	"	8.0MC	"	A12	Adjust for maximum output.
10.	"	"	3.5MC	"	3.5MC	"	A13	Adjust for maximum output. Repeat steps 9 and 10.
11.	"	"	18.0MC	SWII	18.0MC	"	A14	Adjust for maximum output.
12.	"	"	8.5MC	"	8.5MC	"	A15	"
13.	"	"	18.0MC	"	18.0MC	"	A16	"
14.	"	"	8.5MC	"	8.5MC	"	A17	Adjust for maximum output. Repeat steps 13 and 14.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
15.	200mmf	High side to pin 7 (grid) of 6AQ8/ECC85 (V1B). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A18, A19, A20, A21, A22	Adjust for maximum deflection.
16.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
15.	200mmf	High side to pin 7 (grid) of 6AQ8/ECC85 (V1B). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A18, A19, A20, A21, A22	Disconnect stabilizing capacitor C3. Adjust for curve of maximum symmetry similar to Fig. 1.
16.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A23	Reconnect capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17.	270Ω Carbon Resistor	Across FM Antenna terminals	108MC	FM	108MC	DC probe to point (A). Common to chassis.	A24	Adjust for maximum deflection.
18.	"	"	106MC	"	106MC	"	A25	"
19.	"	"	100MC	"	100MC	"	A26	"
20.	"	"	88MC	"	88MC	"	A27	"
21.	"	"	"	"	"	"	A28	"

FIG. 1

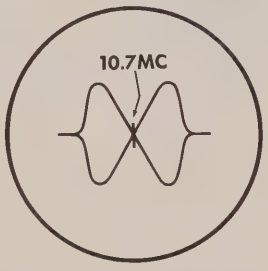
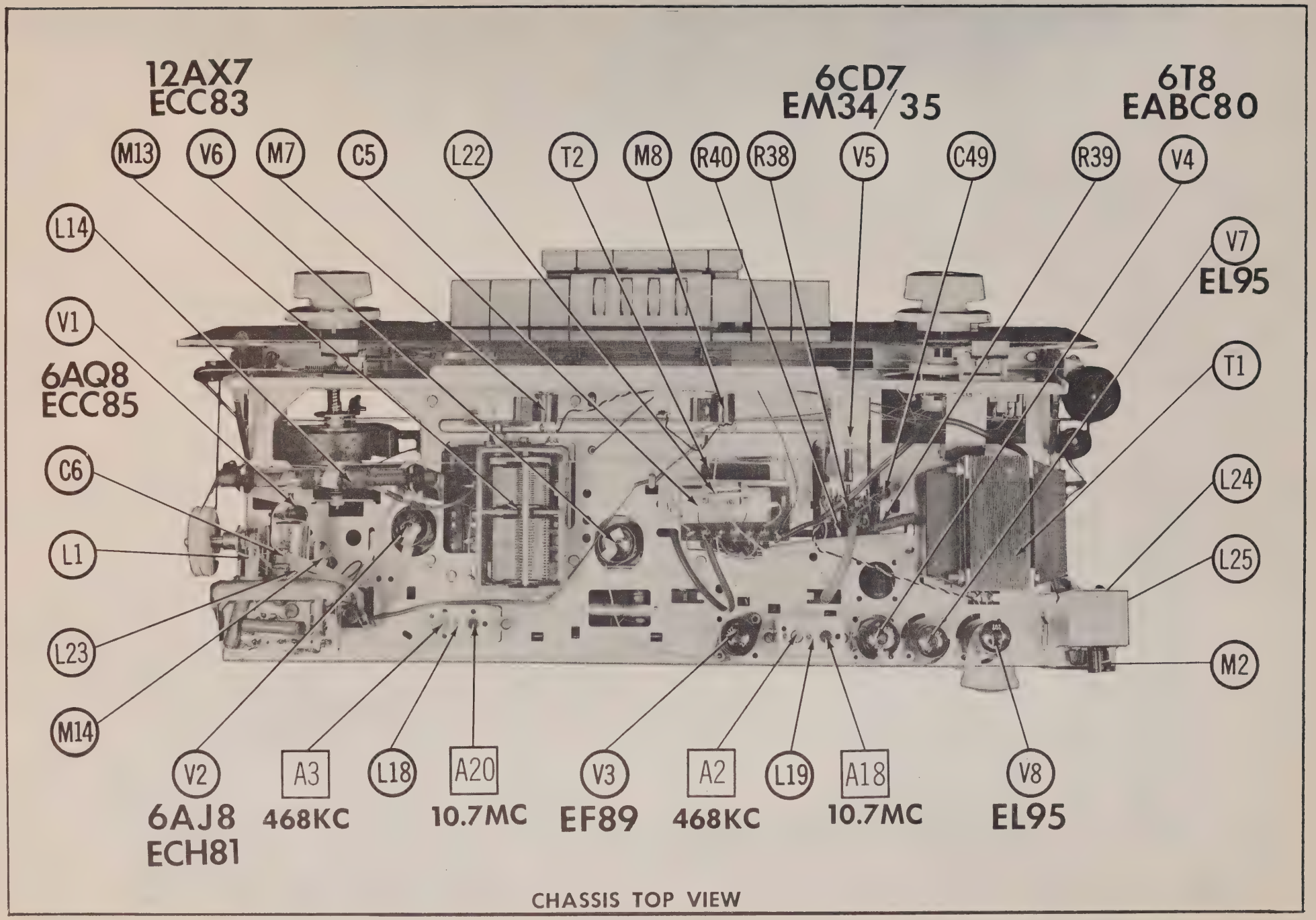


FIG. 2



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	6AQ8/ECC85
V2	1st FM IF Amplifier - AM Mixer - AM Osc.	6AJ8/ECH81
V3	2nd FM - 1st AM IF Amp.	EF89
V4	Ratio Det. - AM Det. - AVC - AF Amplifier	6T8/EABC80
V5	Tuning Indicator	6CD7/EM34-35
V6	Phono Preamplifier - Phase Inverter	12AX7/ECC83
V7	Output	EL95
V8	Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385						S-275	R2582 *
B	50	385						MT-4550	
C2	4	385		PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C3	4	80		PRS150V4	BBR4-150	TC40	TD-4-150	MT-1504	TVA-1402
C4	50	15		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C5	20	40	0820-150	PRS50V20	BBR20-150	TC45	TD-20-150	MT-1520	TVA-1410

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	18					C10V8C			
C7	1000			BPD-001	DD-102	BYA6D1	UC-521	5GA-D1	
C8	1000			BPD-001	DD-102	BYA6D1	UC-521	5GA-D1	
C9	1000			BPD-001	DD-102	BYA6D1	UC-521	5GA-D1	
C10	1.7-10.5								
C11	36								
C12	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C13	18			SI 18	D6-180	LT6Q18	UC-5418	5GA-Q18	
C14	.5-4								
C15	130								
C16	1000			1467-001	D6-102	1W5D1	MC255	1FM-21	
C17	220			DI-00022	DD-221	L10T22	UC-5322	5GA-T22	
C18	30			SI 30	D6-300	LT6Q3	UC-543	5GA-Q3	
C19	820			1467-00082	D6-821	1W5T82		1FM-382	
C20	47			1468-000047	D6-470	5W5Q47	UC-5447	1FM-447	
C21	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C22	3-30								
C23	47			SI 47	D6-470	LT6Q47	UC-5447	5GA-Q47	
C24	3-30								
C25	3-30								
C26	270			1468-00027	D6-271	5W5T27	UC-5327	1FM-327	
C27	36								
C28	3-30								
C29	22			SI 22	D6-220	LT6Q22	UC-5422	5GA-Q22	
C30	3-30								
C31	4700			1467-0047	D6-472	1W5D47	UC-5247	1FM-247	
C32	475								
C33	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C34	3-30								
C35	150			SI 150	D6-151	LT6T15	UC-5315	UC-5315	
C36	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C37	.022	125		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C38	47			1468-000047	D6-470	5W5Q47	UC-5447	5GA-Q47	
C39	8200								
C40	.0047	500		P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C41	220			1468-00022	D6-221	5W5T22	UC-5322	1FM-322	
C42	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C43	.0068	500		P688N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C44	8200								
C45	.047	250		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C46	100			1468-0001	D6-101	5W5T1	UC-531	1FM-31	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C48	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C49	1000			1467-001	D6-102	1W5D1	UC-521	1FM-21	
C50	820			1467-00082	D6-821	1W5T82		1FM-382	
C51	.022	250		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C52	390			1468-00039	D6-391	5W5T39	UC-5339	1FM-339	
C53	330			1468-00033	D6-331	5W5T33	UC-5333	1FM-333	
C54	100			1468-0001	D6-101	5W5T1	UC-531	1FM-31	
C55	470			1468-00047	D6-471	5W5T47	UC-5347	1FM-347	
C56	.022	250		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C57	.0022	250		P488N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C58	270			1468-00027	D6-271	5W5T27	UC-5327	1FM-327	
C59	.015	250		P488N-015	DD16-153	CUB6S15	GEM-4115	4TM-S15	
C60	340								
C61	120			1468-00012	D6-121	5W5T12	UC-5312	1FM-312	
C62	.068	250		P488N-068		CUB4S68	GEM-4168	6TM-S68	
C63	.068	250		P488N-068		CUB4S68	GEM-4168	6TM-S68	
C64	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C65	.047	250		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C66	.001	250		P488N-001	D6-102	CUB6D1	GEM-421	4TM-D1	
C67	680			1467-00068	D6-681	1W5T68	UC-5368	1FM-368	
C68	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C69	270			1468-00027	D6-271	5W5T27	UC-5327	1FM-327	
C70	.001	250		P488N-001	D6-102	CUB6D1	GEM-421	4TM-D1	
C71	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	4TM-S22	
C72	220			1468-00022	D6-221	5W5T22	UC-5322	1FM-322	
C73	.01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C74	.00047	500		P688N-0005	D6-471	CUB6T5	UC-5347	6TM-005	
C75	.0015	500		P688N-0015	D6-152	CUB6D15	GEM-6215	6TM-D15	
C76	.47	250		P488N-47		CUB4P47	GEM-4047	4TM-P47	
C77	.022	250		P488N-022	DD-203	CUB4S22	GEM-6122	6TM-S22	
C78	.1	250		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C79	.015	250		P488N-015	DD16-153	CUB6S15	GEM-4115	4TM-S15	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2	7801-187					Volume, Tap @ 500K &
B	Switch							Ferrite Ant. 1.5meg
R2A	100K	1/2	7806-162					Bass
B	5meg	1/2						Bass
C	5meg	1/2						Treble
D	1000Ω	1/2						Tone
E	1000Ω	1/2						Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R3	470K			
R4	6800Ω			
R5	1800Ω			
R6	1meg			
R7	15K			
R8	1800Ω			
R9	1meg			
R10	39K			
R11	150Ω			
R12	33K			
R13	47Ω			
R14	180Ω			
R15	33K			
R16	10Ω			
R17	220K			

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R18	1000Ω			
R19	56K			
R20	33K			
R21	270Ω			
R22	270Ω			
R23	150K			
R24	330K			
R25	1.8meg			
R26	4700Ω			
R27	22K			
R28	10meg			
R29	330K			
R30	180K			
R31	4.7meg			
R32	220K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R33	12K			
R34	330Ω			
R35	2200Ω			
R36	22K			
R37	470K			
R38	820K			
R39	2.2meg			
R40	1meg			
R41	100K			
R42	2.7meg			
R43	10meg			
R44	47K			
R45	820K			
R46	470K			
R47	10meg			
R48	470K			
R49	10K			
R50	1000Ω			
R51	1.2meg			
R52	470K			
R53	47K			
R54	200Ω			
R55	47K			
R56	1.5meg			
R57	22K			
R58	18Ω			
R59	3300Ω			
R60	180Ω			
R61	2200Ω			
R62	1300Ω 2%	4		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap ⓐ 110V ⓐ .52A	220V ⓐ .077A	6.3V ⓐ 2.8A Tap ⓐ 5V ⓐ .100A	9084-035						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	8500Ω CT	6-8Ω Tap ⓐ 3-4Ω	9060-025							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	Grundig Majestic PART No.	QUAM PART No.	NOTES
SP1	8" X 12"	PM	3-4Ω	7046-002		① Electrostatic
SP2	5" X 7"	PM	3-4Ω	0459-000/XXI	57A21	
SP3	5" X 7"	PM	3-4Ω	0459-000/XXI	57A21	
SP4	3"			7082-002 ①		
SP5	3"			7082-002 ①		

COILS (RF-IF)

ITEM No.	USE	Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Antenna Coil	HFBV1974/I					
L2	RF Choke	HFBV1975/I					Wound on 100Ω resistor
L3	RF Choke	HFBV1956/I					
L4	FM RF Coil	9208-052					
L5	FM Osc. Coil	9208-065					
L6	RF Choke	HFBV1976/I					
L7	Cathode Choke	HFBV1950/I					
L8	1st FM IF Pri.	HFBV1977/I					
L9	1st FM IF Sec.	HFBV1978/I					
L10	AM Antenna Coil	9232-011					
L11	AM Antenna Coil	9231-016					
L12	AM Antenna Coil	9208-059					
L13	IF Trap Coil	9208-055					

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L14	Loop Stick	9233-004					
L15	AM Osc. Coil	9232-008					
L16	AM Osc. Coil	9231-017					
L17	AM Osc. Coil	HFBV1681					
L18A	2nd FM IF	9205-013					Note 1
B	1st AM IF Pri.	9204-008					Note 1
C	1st AM IF Sec.	9204-013					Note 1
L19A	FM Ratio Det.	9206-083					Note 2
B	2nd AM IF Pri.	9204-013					Note 2
C	2nd AM IF Sec.	9204-014					Note 2
L20	Tone Choke	9217-016					
L21	Tone Choke	HFBV1952					
L22	Tone Choke	HFBV2048/I					
L23	Fil. Choke	HFBV1833					
L24	Line Choke	9227-005					
L25	Line Choke	9227-004					
L26	RF Choke	HBV2149/I					

Note 1. Part of IF Assembly, Part #7207-308.
Note 2. Part of IF Assembly, Part #7207-317.

RECTIFIER

ITEM No.	RATING CURRENT (Measured)	Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.077A	B250C75		60-9150 ①③	D-56 ②	① Selenium Type ② Silicon Type ③ Two required.

FUSES

ITEM No.	TYPE	RATING	Grundig Majestic PART No. FUSE	Grundig Majestic PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2		0.7A 110V S/B	0.7A 110V S/B ①	101			AGX1	
M3		0.5A	0.5A					

① .4A used with 220 Volt input.

PHONO CARTRIDGE

ITEM No.	Grundig Majestic PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M4						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	Grundig Majestic PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M5		♦ RX-552D or ♦ RX-552LPD		♦ Diamond

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M6	Pilot Lamp		110V, 15W, Record Changer Compartment
M7	Dial Lamp		7V . 3A
M8	Dial Lamp		7V . 3A
M9	Pilot Lamp		6V . 1A, Tone Control Keyboard
M10	Pilot Lamp		6V . 1A, Tone Control Keyboard
M11	Pilot Lamp		6V . 1A, Tone Control Keyboard
M12	Pilot Lamp		6V . 1A, Tone Control Keyboard
M13	Tuning Cap.	1005-022	AM (Ant. 9-550mmf, Osc. 13-465mmf)
M14	Tuning Cap.	9653-601	FM
M15	Switch	7404-548	Power On-Off, Toggle Type
M16	Assembly	7612-021	Press Button Device, Band Switch
M17	Assembly	7612-019	Contact Slide Device For Tone Control Board

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	9616-532	Tuning
Knob	9616-538	Antenna Switch
Knob	9616-536	Volume
Cabinet	2046-111	
Dial Pointer	1035-094	AM
Dial Pointer	1032-073	FM
Dial Scale	2046-115	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K ($7\frac{1}{2}$ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

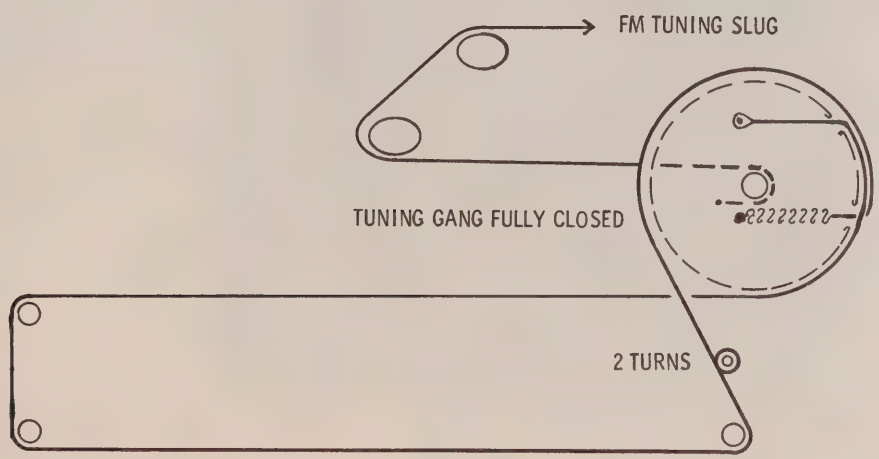
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TONFUNK MODEL W706

TONFUNK
MODEL W706

TONFUNK
MODEL W706

TRADE NAME	Tonfunk Model W706		
SUPPLIER	Videola-Erie Corp., 75 Front Street, Brooklyn 1, N. Y.		
TYPE SET	AC Operated FM-AM Receiver		
TUBES (Five)	Types 6AQ8/ECC85 FM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM Osc., EF89 2nd FM IF Amp.-AM IF Amp., 6T8/EABC80 Ratio Det.-AM Det.-AVC-AF Amp., EL95 Output		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.37 Amp. @ 117 Volts AC (33 Watts)
TUNING RANGE—BROADCAST	530-1620KC	FREQ. MOD.	88-108MC



SET 403 FOLDER 9

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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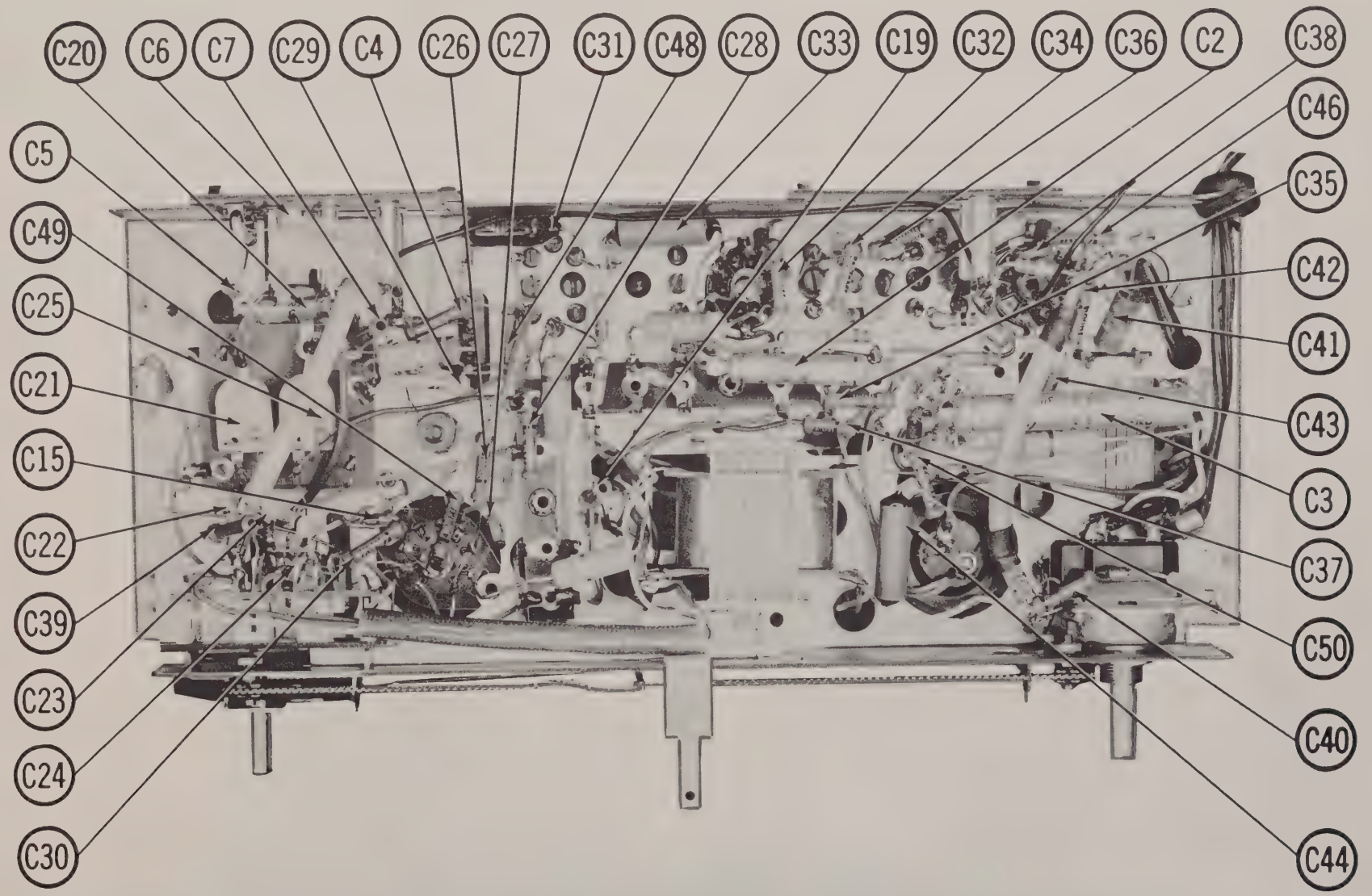
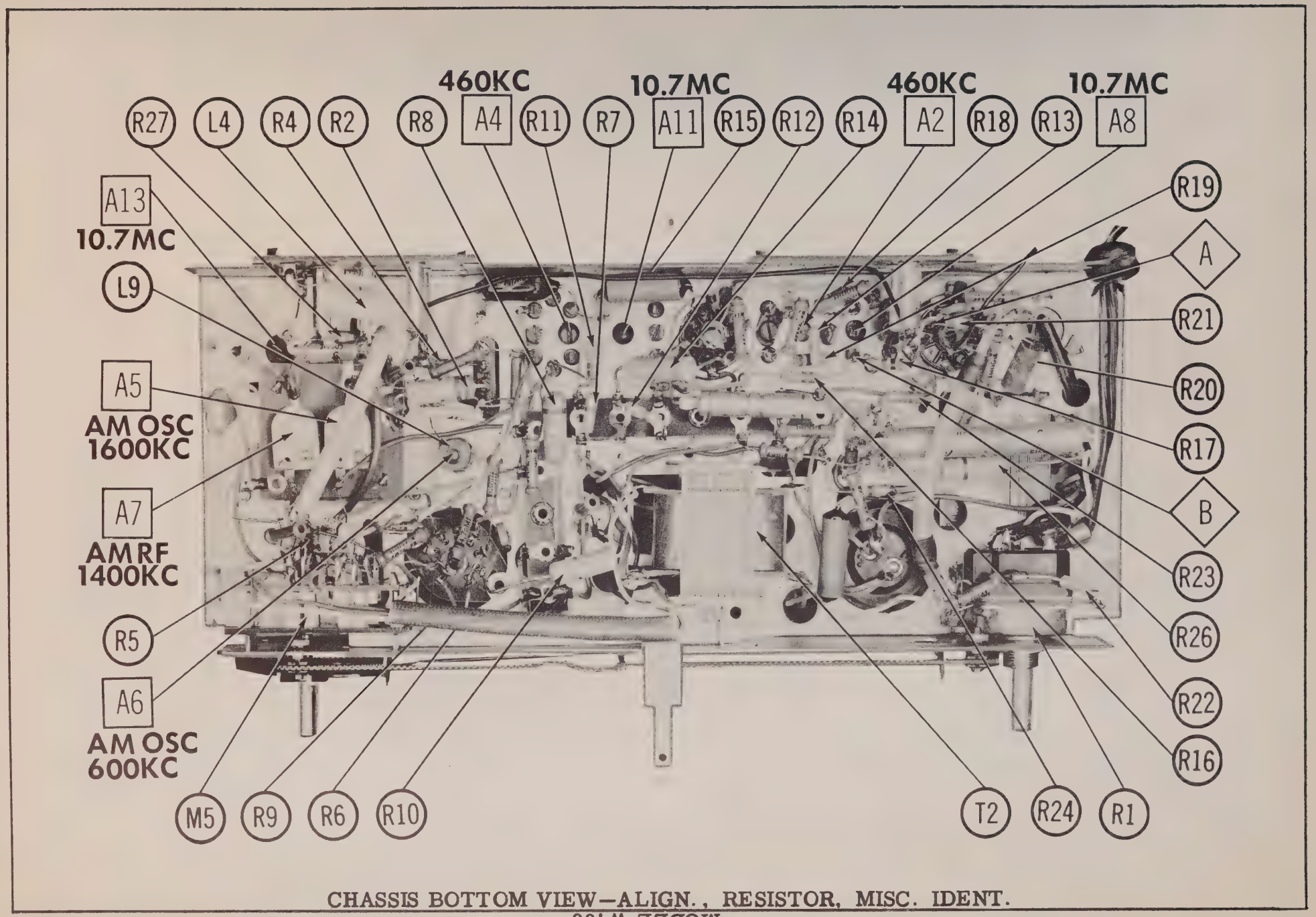
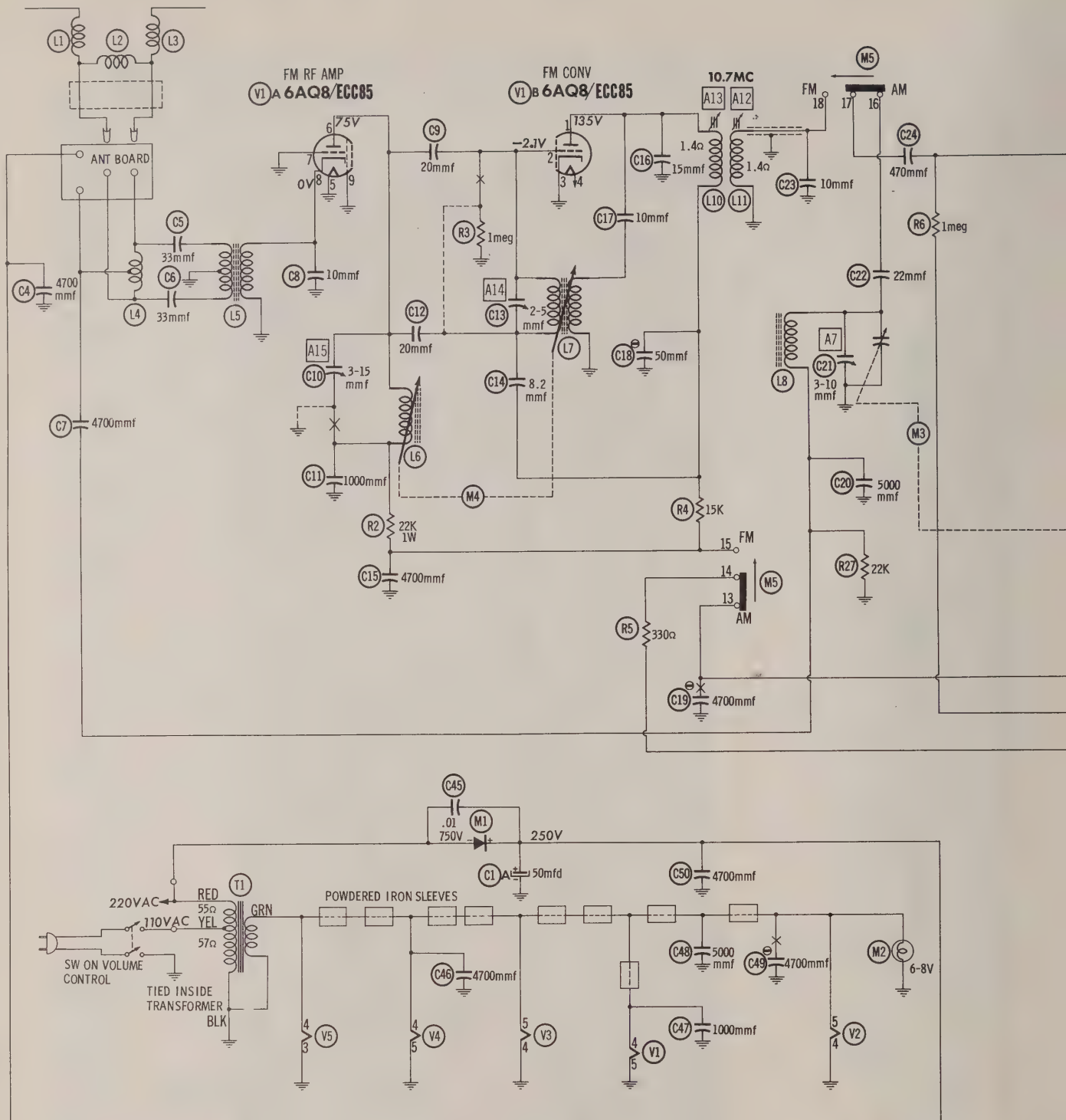
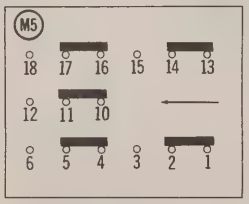


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW—ALIGN., RESISTOR, MISC. IDENT.





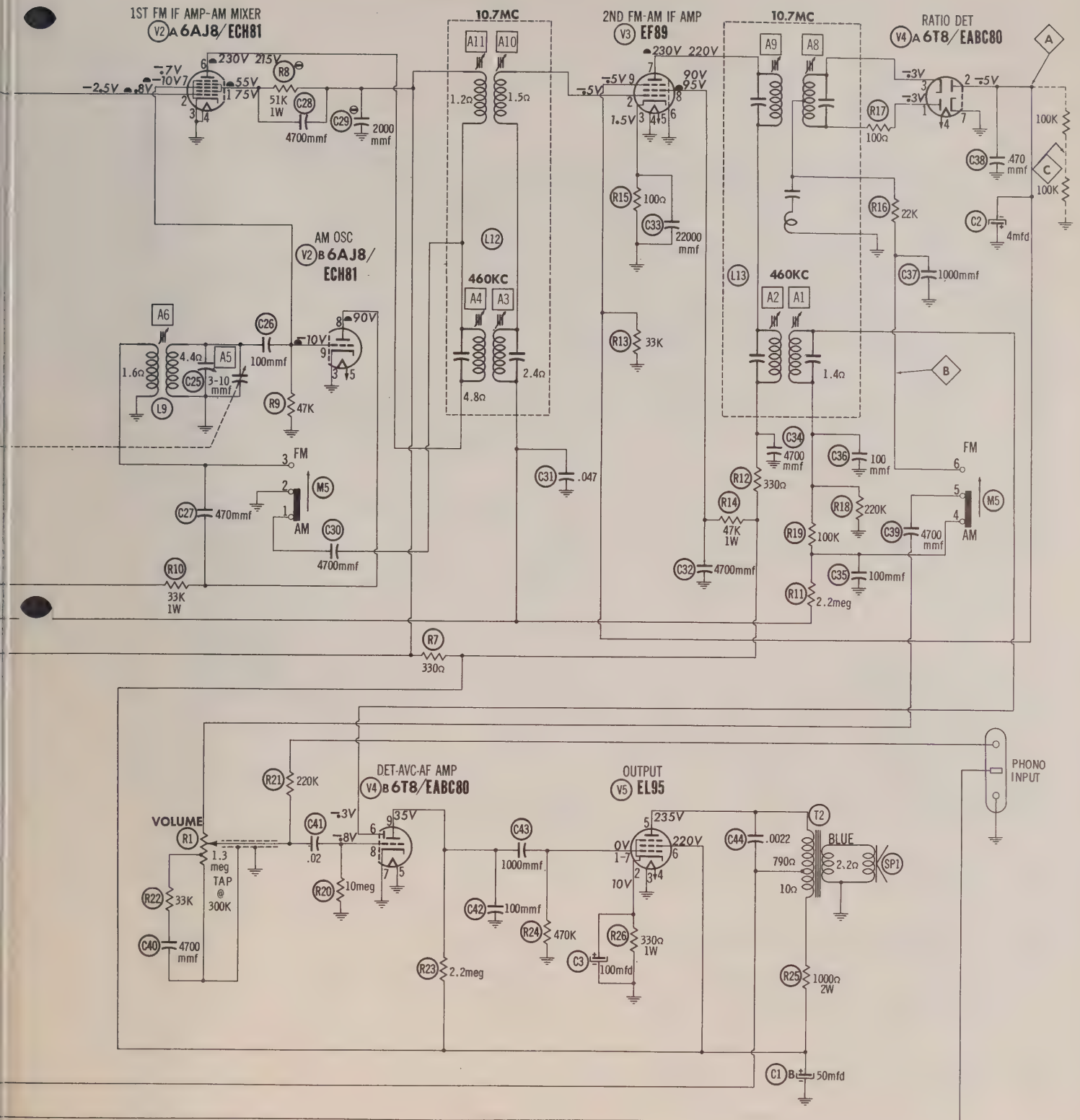
AM-FM SELECTOR SWITCH (M5). SHOWN IN AM POSITION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†17K	1meg	0Ω	.2Ω	0Ω	†24K	0Ω	.1Ω	0Ω
V2	ECH81 6AJ8	†52K	3.5meg	0Ω	0Ω	.2Ω	†1300Ω	47K	▲33K	47K
V3	EF89	0Ω	2.5meg	100Ω	0Ω	.2Ω	0Ω	†1300Ω	†48K	33K
V4	EABC80 6T8	INF	33K	INF	.2Ω	0Ω	220K	0Ω	10meg	†2.2meg
V5	EL95	470K	330Ω	0Ω	.1Ω	†790Ω	†1000Ω	470K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM OUTPUT OF M1
▲ MEASURED IN "AM" POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

403-9

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	460KC (400~ Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	"	600KC	"	A6	"
4.		"	1400KC	"	1400KC signal	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to B-. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	200mmf	High side to pin 2 (grid) of EF89 (V3). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A8	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	Direct	High side to ungrounded tube shield on 6AQ8/ECC85 (V1). Low side to chassis.	10.7MC	"	"	DC probe to point (A). Common to chassis.	A10, A11, A12, A13	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	200mmf	High side to pin 2 (grid) of EF89 (V3). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A8	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A9	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.
7.	Direct	High side to ungrounded tube shield on 6AQ8/ECC85 (V1). Low side to chassis.	"	"	"	Vert. Amp. to point (A). Low side to chassis.	A10, A11, A12, A13	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. Reconnect capacitor C2.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across FM antenna terminals.	105MC	FM	105MC	DC probe to point (A). Common to chassis.	A14, A15	Adjust for maximum deflection.

FIG. 1

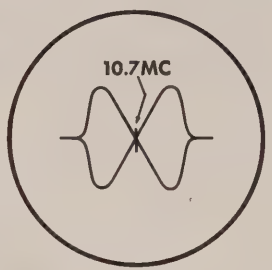


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp. - AM Mixer-AM Oscillator	6AJ8/ECH81
V3	2nd FM IF Amp. - AM IF Amplifier	EF89
V4	Ratio Det. - AM Det. - AVC - AF Amplifier	6T8/EABC80
V5	Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TONFUNK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385		PR4-200	BBRQ0174		CDB-Q-422	D-190	R2462 *
B	50	385							
C2	4	80		PRS150V4	BBR4-150	TC40	TD-4-150	MT-1504	TVA-1402
C3	100	15		PRS15V100	BBR100-15	TC2501	TD-100-15	MTH-1510	TVA-1160

* Non Catalog Item

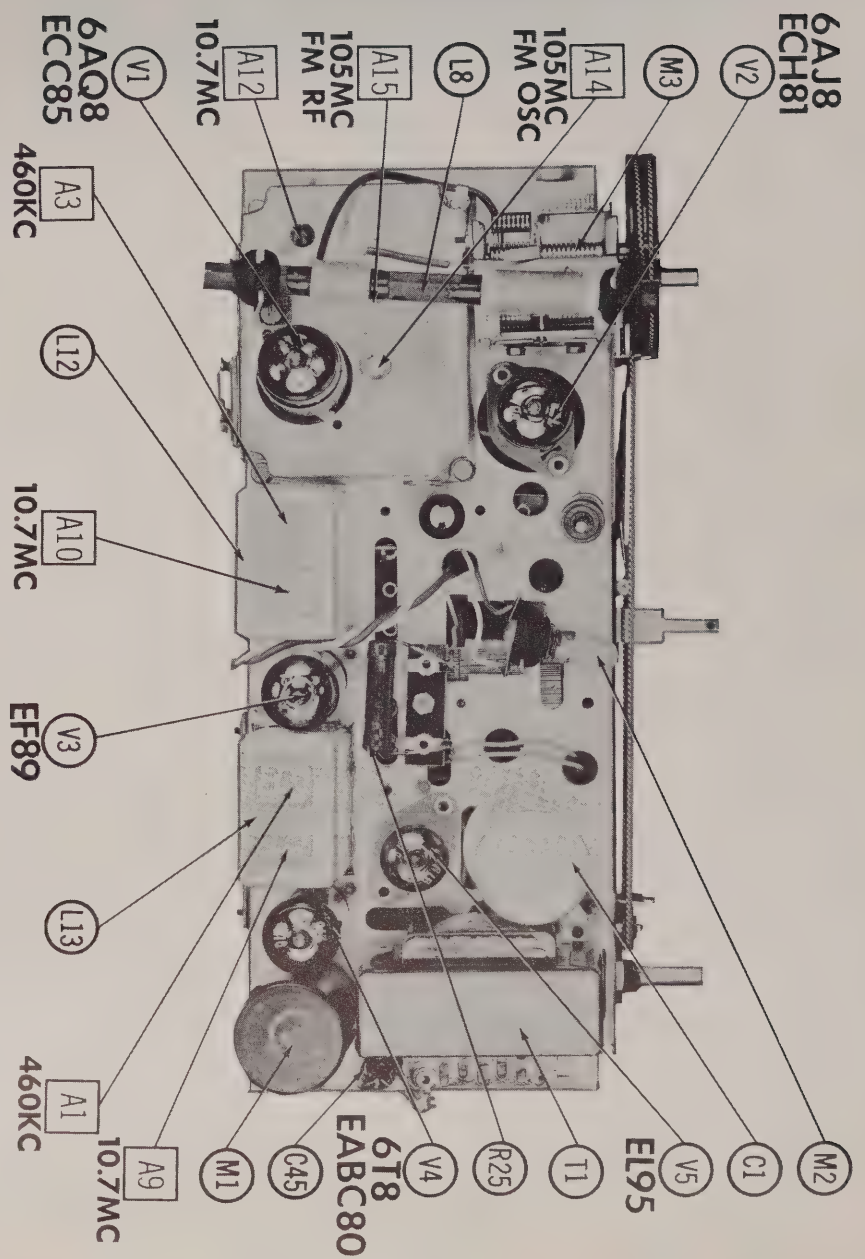
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TONFUNK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C5	33			SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C6	33			SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C7	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C8	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C9	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C10	3-15									
C11	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C12	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C13	2-5									
C14	8.2			NPO-SI 8.2		C10V82C	TCO-8.2			
C15	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C16	15			SI 15	D6-150	LT6Q15	GP-15	UC-5415	5GA-Q15	
C17	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C18	50			SI 50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	①②
C19	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	②
C20	5000			1467-005	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C21	3-10									
C22	22			SI 22	D6-220	LT6Q22	UC-5422	UC-5422	5GA-Q22	
C23	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C24	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C25	3-10									
C26	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C27	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C28	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C29	2000			SI 2000	D6-202	LT6D2	GP-2000	UC-522	5GA-D2	③
C30	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C31	.047	125		P288N-047	DF-503	CUB2S47		GEM-4147	4TM-S47	
C32	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C33	22000			SI 20000	DD-203	LT6S2	ED-02		5GA-S2	
C34	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C35	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C36	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C37	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C38	470			SI 470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C39	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C40	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C41	.02	150		P288N-02	DD-203	CUB2S5	ED-02	GEM-412	4TM-S2	
C42	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C43	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C44	.0022	500		P688N-0022	D6-222	CUB6D22	GP-2200	UC-5222	6TM-D22	
C45	.01	750		P1088N-01	DD-103	CUB10S1		GEM-1011	10TM-S1	
C46	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	
C47	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C48	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C49	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	②
C50	4700			SI 4700	D6-472	LT6D47	GP-4700	UC-5247	5GA-D47	

① Some versions may use 47mmf in this application.
② Not used in some versions.
③ Some versions may use 2200mmf in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TONFUNK PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	1.3meg Switch	½						Volume, Tap @ 300K

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TONFUNK PART No.	NOTES
	OHMS	WATT		
R2	22K	1		Note 1
R3	1meg			
R4	15K			
R5	330Ω			
R6	1meg			
R7	330Ω			
R8	51K	1		
R9	47K			
R10	33K	1		
R11	2.2meg			
R12	330Ω			
R13	33K			
R14	47K	1		

ITEM No.	RATING		TONFUNK PART No.	NOTES
	OHMS	WATT		
R15	100Ω			
R16	22K			
R17	100Ω			
R18	220K			
R19	100K			
R20	10meg			
R21	220K			
R22	33K			
R23	2.2meg			
R24	470K			
R25	1000Ω	2		
R26	330Ω	1		
R27	22K			

Note 1. Some versions may use 47K 1W in this application.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TONFUNK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V @ .050A Tap @ 110V @ .37A	6.3V @ 1.8A		N114						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TONFUNK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω	6-8Ω	BVA126							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TONFUNK PART No.	QUAM PART No.	
SP1	3 3/4" X 6" PM		6-8Ω	P915		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TONFUNK PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil						1.25 Microhenries
L2	FM Ant. Coil						1 Microhenry
L3	FM Ant. Coil						1.25 Microhenries
L4	FM Ant. Coil						
L5	FM Ant. Trans.						
L6	FM RF Coil						
L7	FM Osc. Coil						
L8	Loop Stick						
L9	AM Osc. Coil						
L10	1st FM IF Pri.						
L11	1st FM IF Sec.						
L12	2nd FM IF - 1st AM IF	BV2093					
L13	Ratio Det. - 2nd AM IF	BV2094					

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	TONFUNK PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.047A	E250C85L		60-9150		

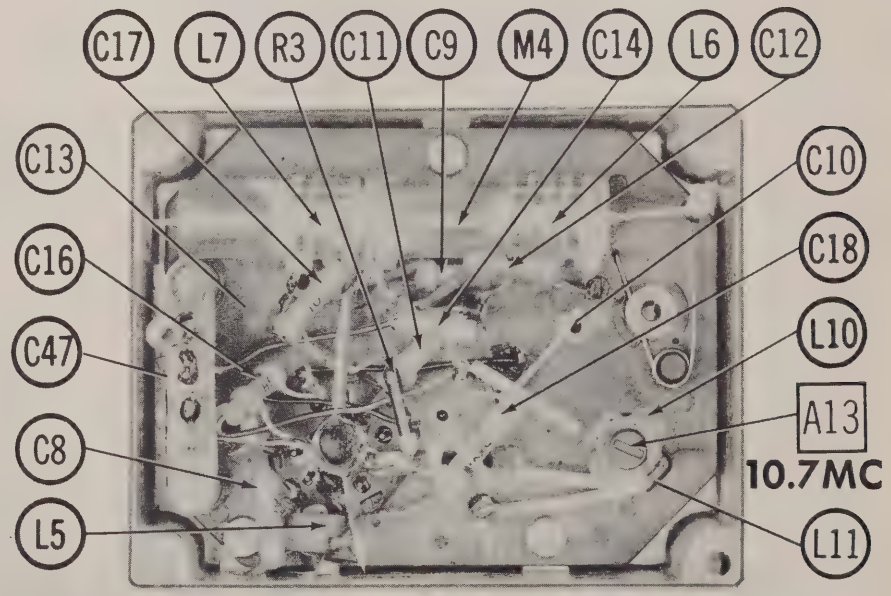
MISCELLANEOUS

ITEM No.	PART NAME	TONFUNK PART No.	NOTES
M2	Pilot Lamp		6-8V
M3	Tuning Cap.		AM, 2 Gang (Ant. 11-330mmf, Osc. 11-150mmf)
M4	Tuning Cap.		FM
M5	Switch		AM-FM (Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



FM RF SUB CHASSIS

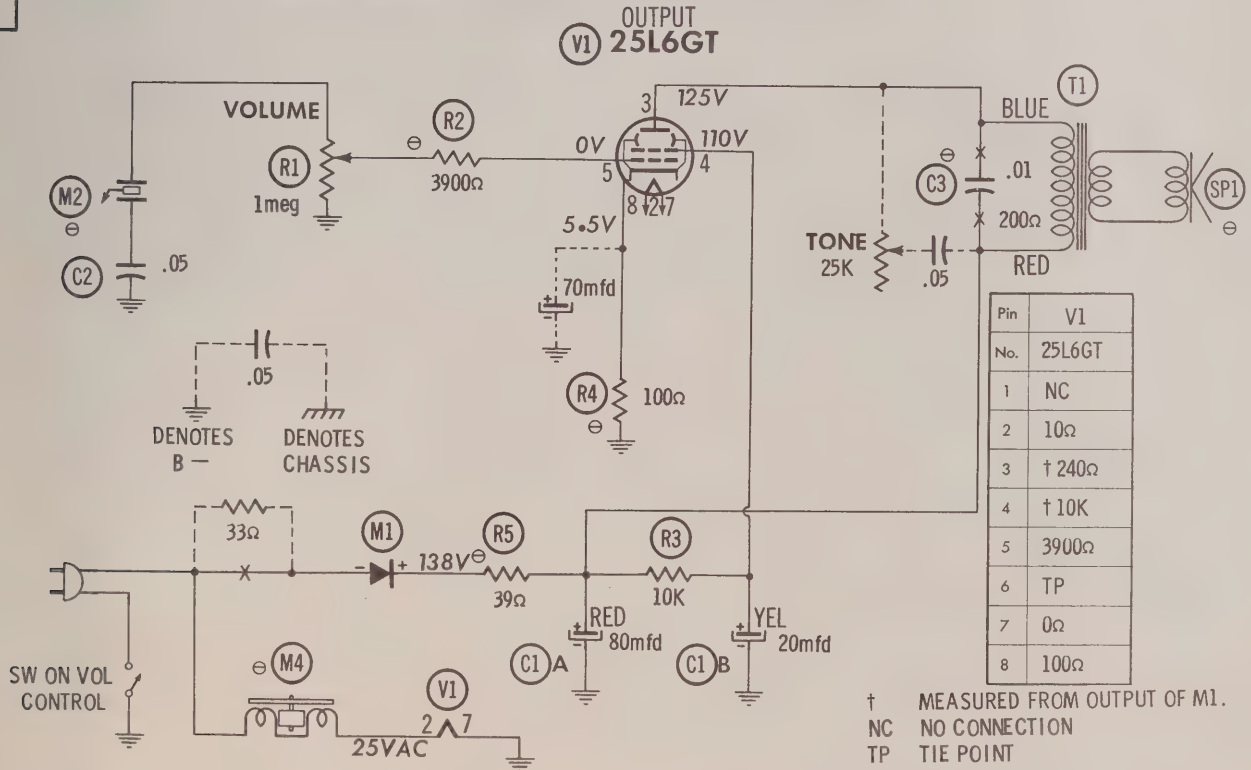
PHOTOFACT* Folder

TRUETONE MODELS D5801A, D5802A, D5804A

TRUETONE MODELS
D5801A, D5802A, D5804A

TRADE NAME	Truetone Models D5801A, D5802A, D5804A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated Phono Amplifier With Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING .40 Amp. @ 117 Volts AC (35 Watts)

MODELS D5801A AND D5802A ARE 3 SPEED MANUAL RECORD PLAYERS.
MODEL D5804A IS A 4 SPEED MANUAL RECORD PLAYER.



Pin No.	V1 25L6GT
1	NC
2	10Ω
3	† 240Ω
4	† 10K
5	3900Ω
6	TP
7	0Ω
8	100Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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SET 403 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	EC-38	PRS150V8020	BBRT44215	FP227.4	TDLT-4	FMD-303	*R2504
B	20	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	PC-5	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C3	.01	400		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	①

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-70	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R2	3900Ω			Note 1
R3	10K		IR-37	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R4	100Ω		IR-36	Note 2
R5	39Ω			Note 3

Note 1. Some versions may use 4700Ω (Part #IR-18) in this application.
Model D5804A may use 47K (part #IR-10) in this application.
Note 2. Models D5804A may use 150Ω (Part #IR-14) in this application.
Note 3. Models D5801A and D5802A may use 33Ω (Part #IR-17) in this application.
Model D5804A may use 47Ω (Part #IR-41) in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-9Ω	Part of SP1	Z1101 ①	A-3025 ①		A-3332 ①	24S53①	S-1X ①	① Bend ears down.

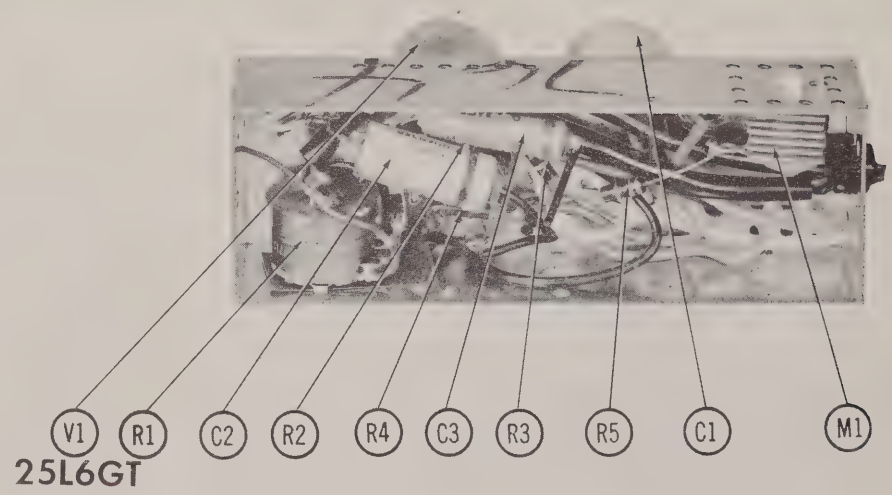
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SPK-58 ①	4A06	① Used in Models D5801A. D5802A, Includes T1.
	4"	PM		SP-23 ②		② Used in Model D5804A. Includes T1.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	TRUETONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.065A	SR-3	1003A	RS075	75	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	TRUETONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	PU-20C	12-U	N4-2			Models D5801A, D5802A
	PU-21	310TS	N8-1 & N8-3			Model D5804A

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRUETONE PART No.	JENSEN PART No.	WALCO PART No.	
M3	(78RPM)	†CRA-55 or ♦ CRA-55D	†W64S or ♦W64D	Model D5804A
	(LP)	†CRA-55LP or ♦CRA-55LPD	†W64MGS or ♦W64MGD	Models D5801A, D5802A

† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Phono Motor	M-12	3 Speed (Models D5801A, D5802A)
	Phono Motor	M-15	4 Speed, includes turntable (Model D5804A)

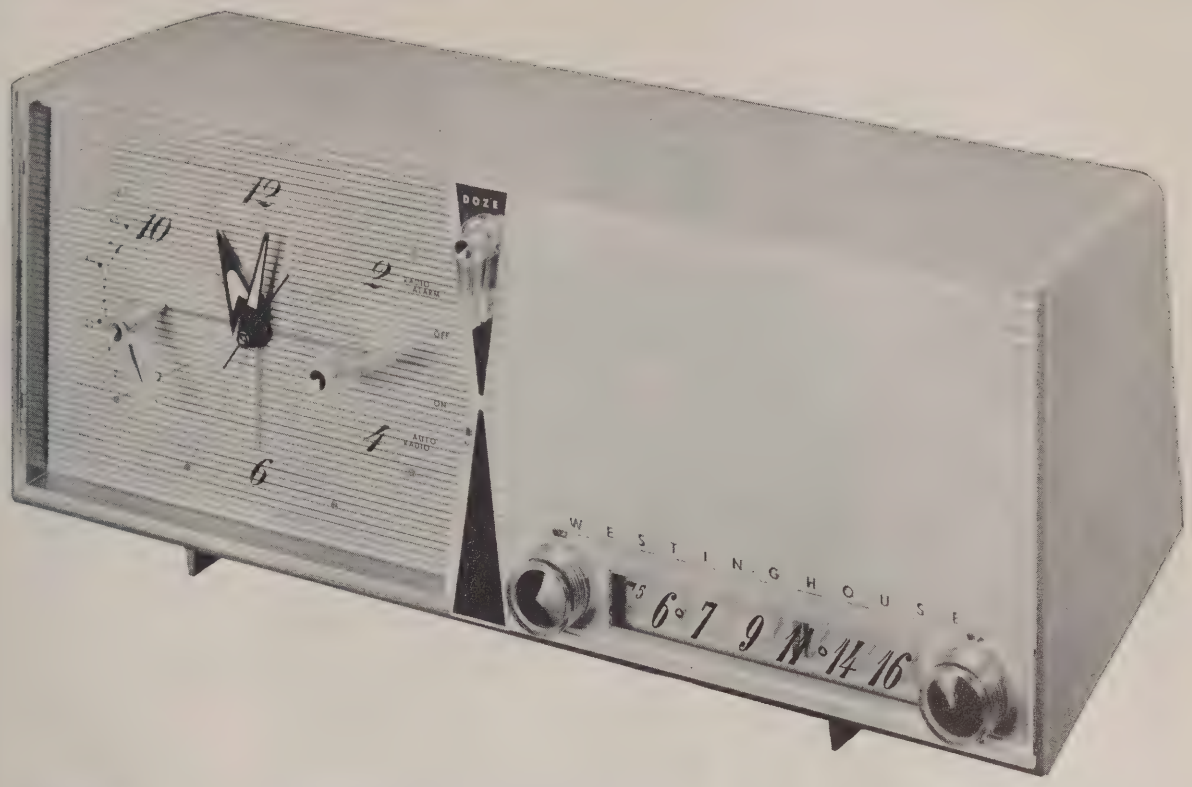
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

WESTINGHOUSE MODELS H-636T6, H-637T6, H-638T6, H-644T6, H-645T6 (Ch. V-2391-1, -2)

WESTINGHOUSE MODELS H-636T6, H-637T6, H-638T6, H-644T6, H-645T6 (Ch. V-2391-1, -2)



WESTINGHOUSE MODELS H-636T6, H-637T6, H-638T6, H-644T6, H-645T6 (Ch. V-2391-1, -2)

TRADE NAME	Westinghouse Models H-636T6, H-637T6, H-638T6 (Ch. V-2391-1) H-644T6, H-645T6 (Ch. V-2391-2)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated AM Receiver (Models H-644T6, &H-645T6 are Clock Versions)
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC- AF Amp., 35C5 Output, 35W4 Rectifier.
POWER SUPPLY	110-120Volts AC-60 Cycles — RATING .28 Amp. @117 Volts AC (26Watts without Clock)
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain in output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200mmfd	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across Voice Coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	High side to pin 1 (grid) of 12BA6 (V1). Low side to chassis.	1600KC	1600KC	"	A5	"
3.		"	1400KC	1400KC	"	A6	"
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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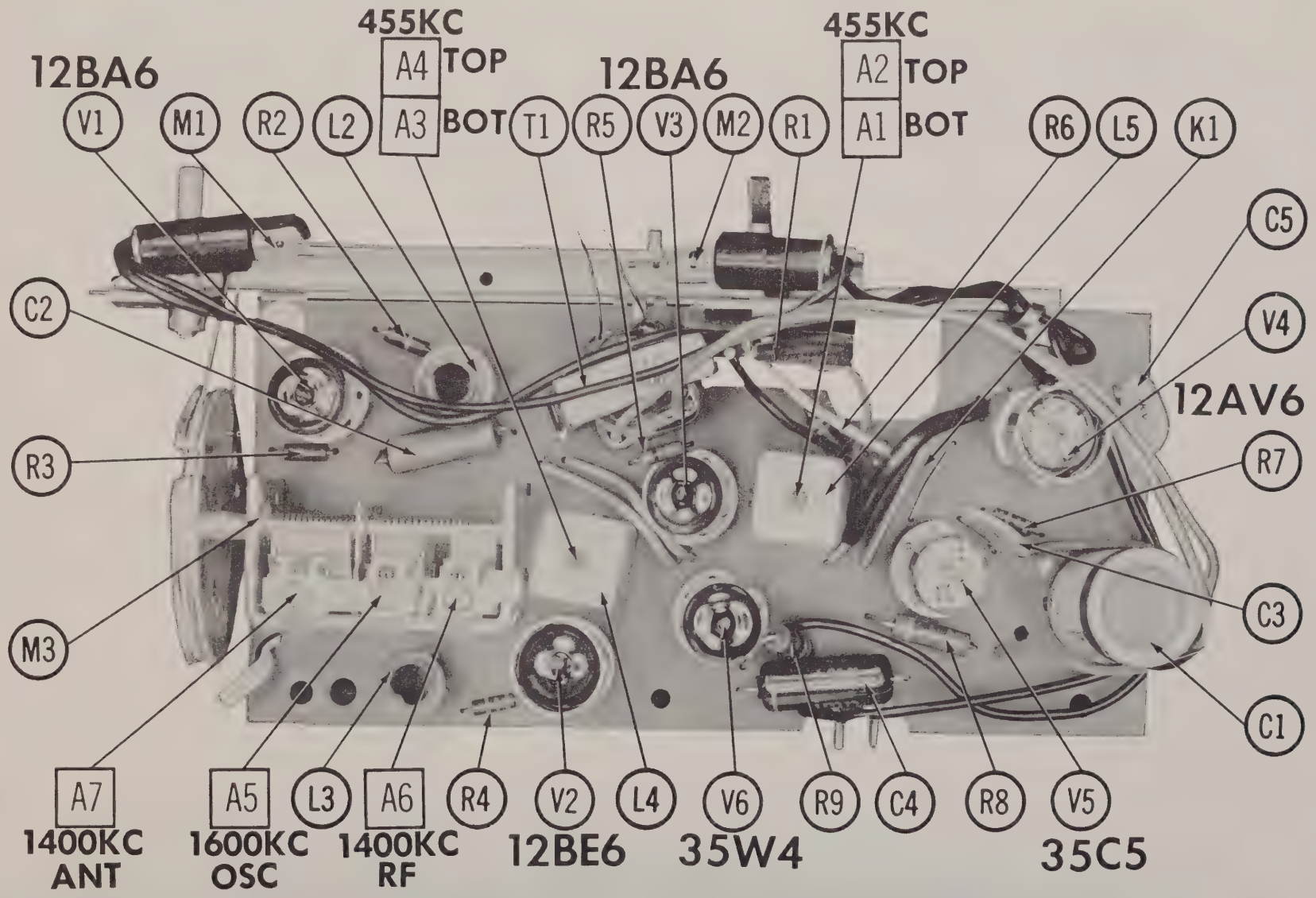


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det-AVC-AF Amp.	12AV6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 80	150	218V042H01 ①	PRS150V8040	BBRD8415	WD220	TDLD-10	MTD-303	TVA-2460
B	▲ 30	150							

① Alternate Part # 759V029H02

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200	210V111H05	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C3	10000	1000	215V300H03		DD-103	BYA10S1		10HKB-S1	
C4	.047	400	210V204A73	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C5	10000	1000	215V111A03		DD-103	BYA10S1		10HKB-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	270V039H02	AB-60	A47-500K-Z	Q13-133	U48 †	Volume Note 1
B	Shaft			AK-9 *	RS-3 *	HQ	Not Req.	

Note. 1 Volume & Switch Part # 270V039H01 used in Models without clock.
* File groove for dial string, File flat for knob as needed.
† File groove for dial string.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R2	10K		250V231A03	
R3	220Ω		250V232A21	
R4	22K		250V232A23	
R5	100Ω		250V231A01	Note 1
R6	3.3meg		250V233A35	
R7	180Ω		250V221A81	
R8	1200Ω	1	250V321A22	
R9	33Ω	1	250V323A30	

Note 1. Some versions may use 150Ω in this application (Part# 250V231A51)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3100Ω	3-4Ω	430V043H01		A-3025②	AU-605 ②	A-3332 ②	24S53 ②	S-12X②	② Use original channel frame.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Westinghouse PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	570V025H01	4A07	Used in Models H-644T6, H-645T6
	2 5/8" x 10"	PM	3-4Ω	570V024H01		Used in Models H-636T6, H-637T6, H-638T6

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	317V006H07					Includes cabinet back & Aux. outlet.
	Loop Ant.	317V006H06					Includes mtg. brackets; Note 1
L2	RF Trans.	230V037H01					
L3	Osc. Coil	230V004H02					
L4	Input IF	235V023H12	16-6780	BC-356	13-PC9	RF-4	
	Input IF	235V023H01	16-6780	BC-356	13-PC9	RF-4	Alternate
L5	Output IF	235V023H12	16-6780	BC-357	13-PC10	RF-4	
	Output IF	235V023H01	16-6780	BC-357	13-PC10	RF-4	Alternate

Note. 1 Used in Models H-636T6, H-637T6, H-638T6

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	100mmf, 150mmf, 220mmf 5000mmf, 5000mmf, 6.8meg, 470K, 470K	219V001H01	Centralab PC-158 Sprague DT-5

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Dial Lamp	756V501H03	#1490
M2	Dial Lamp	756V501H03	#1490
M3	Tuning Cap.	330V012H01	3 Gang (Ant. 24-392mmf)
	Pointer	558V089H02	Models H-644T6 H-645T6
	Pointer	558V089H01	Models H-636T6, H-637T6, H-638T6

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

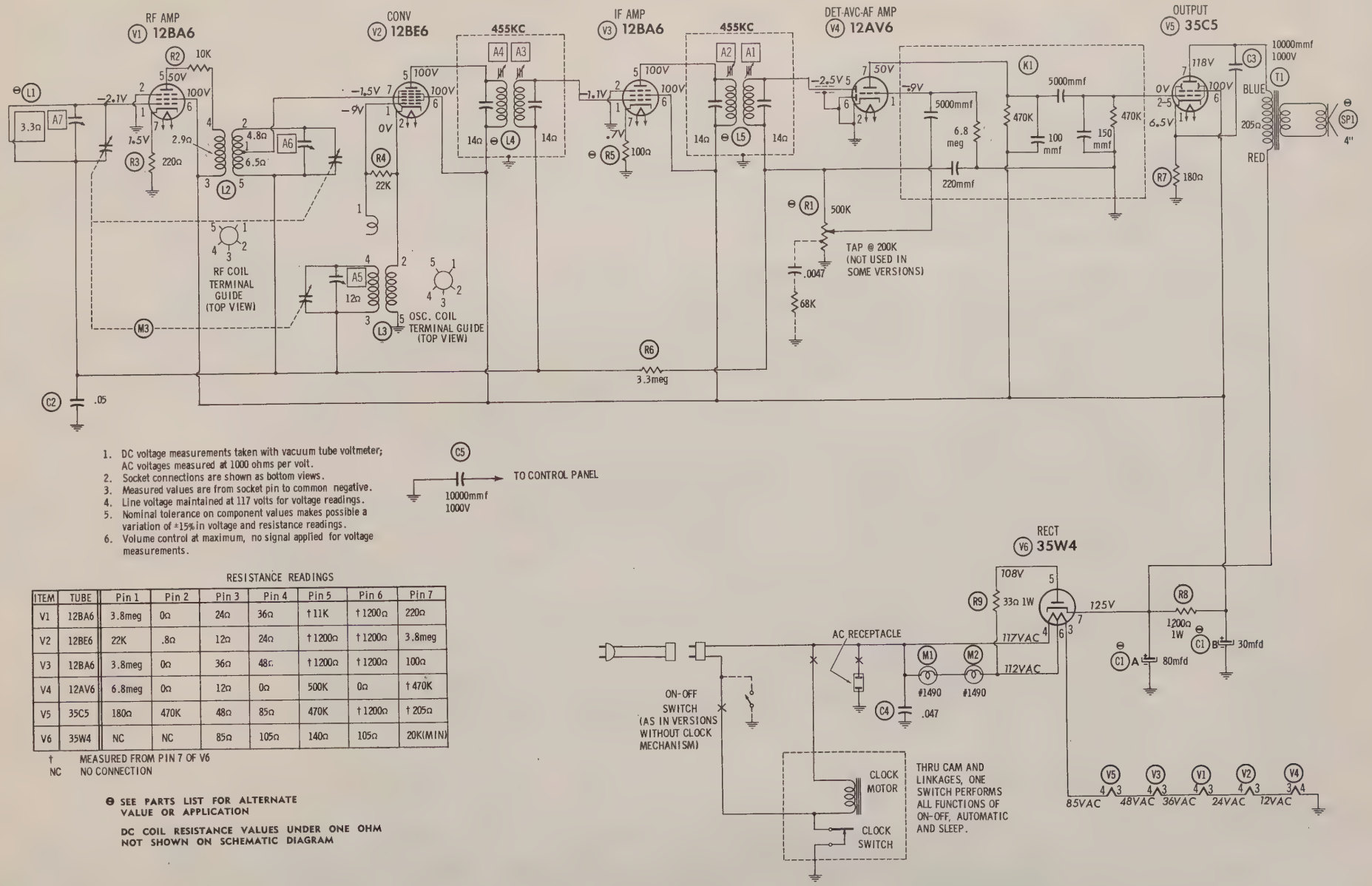
NAME	PART NO.	DESCRIPTION
Knob	550V053H01	Clock
Knob	550V035H03	Volume, Tuning
Cabinet	513V017H10	Ivory & White, Model H-644T6
Cabinet	513V017H11	Coral & White, Model H-645T6
Cabinet	513V017H04	Ivory & White, Model H-636T6
Cabinet	513V017H05	Coral & White, Model H-637T6
Cabinet	513V017H06	Charcoal & White, Model H-638T6
Crystal	558V082H01	Crystal, Clock

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

WESTINGHOUSE MODEL H-636T6 (Ch. V-2391-1)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3.8meg	0Ω	24Ω	36Ω	†11K	†1200Ω	220Ω
V2	12BE6	22K	.8Ω	12Ω	24Ω	†1200Ω	†1200Ω	3.8meg
V3	12BA6	3.8meg	0Ω	36Ω	48Ω	†1200Ω	†1200Ω	100Ω
V4	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V5	35C5	180Ω	470K	48Ω	85Ω	470K	†1200Ω	†205Ω
V6	35W4	NC	NC	85Ω	105Ω	140Ω	105Ω	20K(MIN)

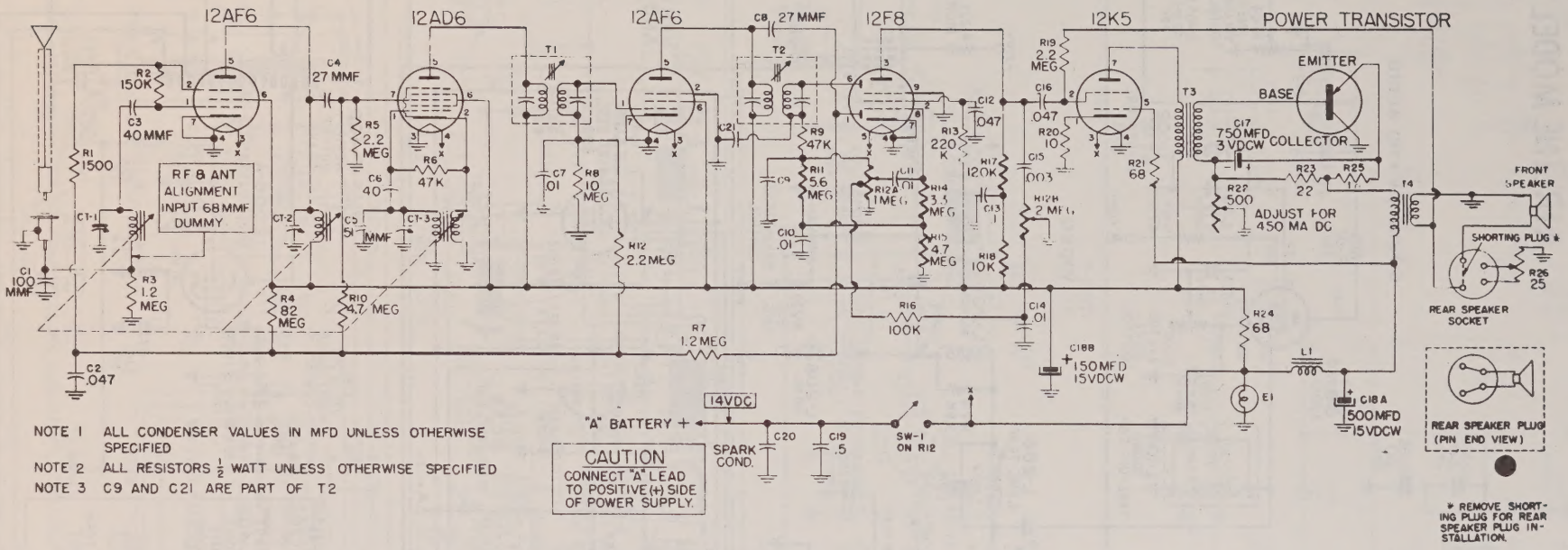
† MEASURED FROM PIN 7 OF V6
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

AUTOMATIC MODELS CRT-97, CTR-77, DET-27



NOTE 1 ALL CONDENSER VALUES IN MFD UNLESS OTHERWISE SPECIFIED

NOTE 2 ALL RESISTORS ½ WATT UNLESS OTHERWISE SPECIFIED

NOTE 3 C9 AND C21 ARE PART OF T2

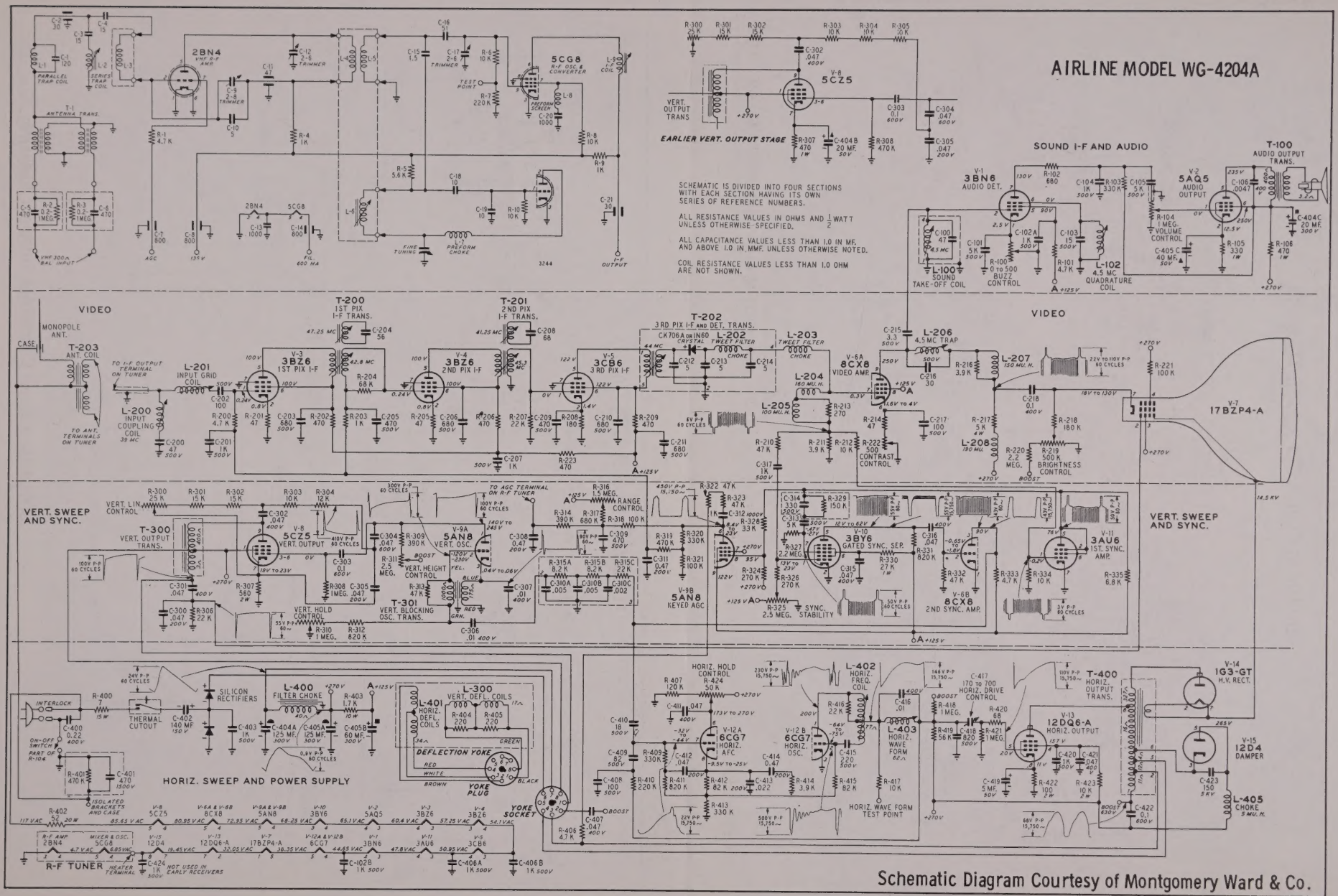
* REMOVE SHORTING PLUG FOR REAR SPEAKER PLUG INSTALLATION.

ALIGNMENT FREQUENCIES
IF: 265KC
OSC: 1610KC
RF: 1610KC
ANT: 1610KC

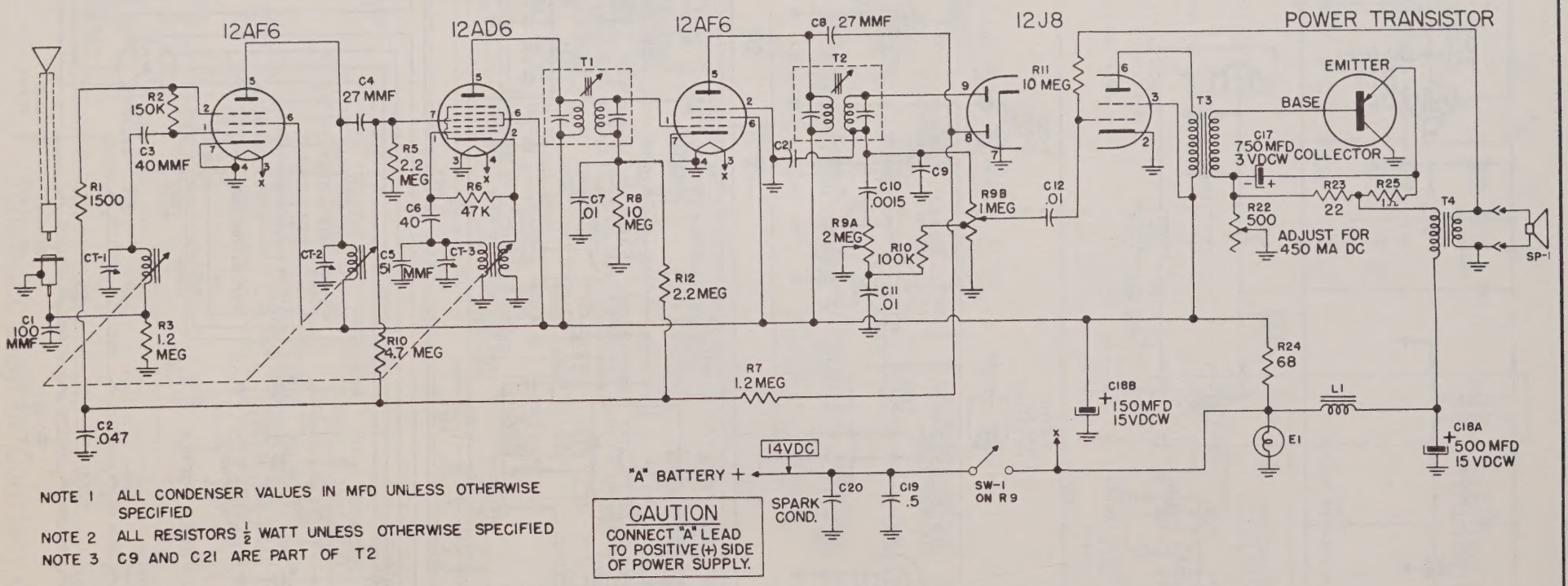
Schematic Diagram Courtesy of Automatic Radio Mfg. Co., Inc.

Howard W. Sams & Co., Inc. 1958

SET 403 FOLDER 12-S


AIRLINE MODEL WG-4204A
SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS.
ALL RESISTANCE VALUES IN OHMS AND 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.
COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.
EARLIER VERT. OUTPUT STAGE
SOUND I-F AND AUDIO
VIDEO
VERT. SWEEP AND SYNC.
HORIZ. SWEEP AND POWER SUPPLY
R-F TUNER
Schematic Diagram Courtesy of Montgomery Ward & Co.

AUTOMATIC MODELS CTR-77A, FTP-37A

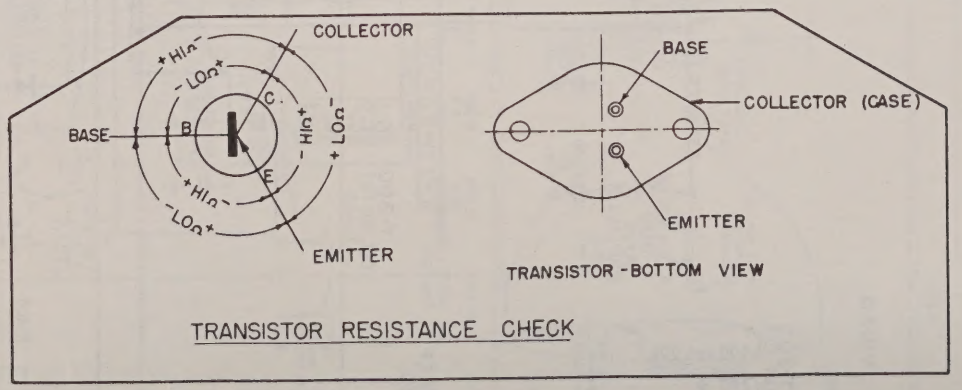


NOTE 1 ALL CONDENSER VALUES IN MFD UNLESS OTHERWISE SPECIFIED

NOTE 2 ALL RESISTORS $\frac{1}{2}$ WATT UNLESS OTHERWISE SPECIFIED

NOTE 3 C9 AND C21 ARE PART OF T2

CAUTION
CONNECT "A" LEAD TO POSITIVE (+) SIDE OF POWER SUPPLY.



TRANSISTOR RESISTANCE CHECK

Schematic Diagram Courtesy of Automatic Radio Mfg. Co., Inc.